Service Manual

Laser Printer

KX-P7100

KME CONFIDENTIAL

Panasonic®
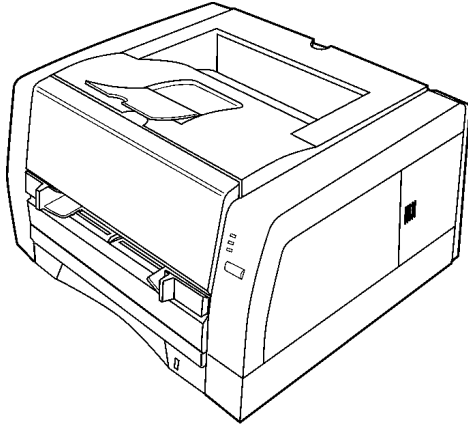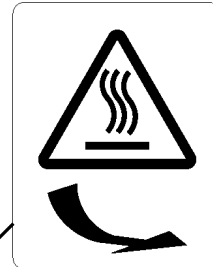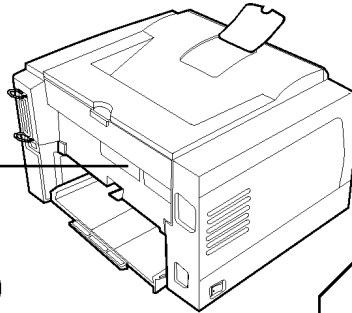
⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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CLASS  1 LASER PRODUCT
KLASSE 1 LASER PRODUKT
CLASSE 1 LASER PRODUIT
CLASE  1 LÁSER PRODUCTO
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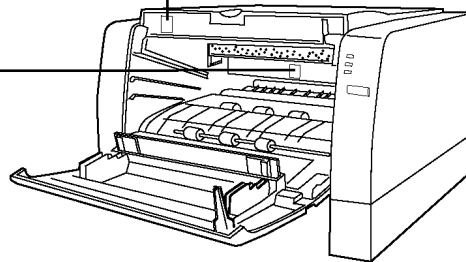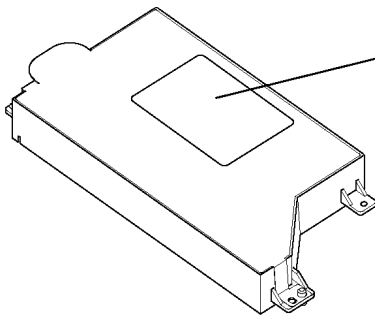
(Only for 220-240 V equipment)

CAUTION
HOT SURFACE INSIDE
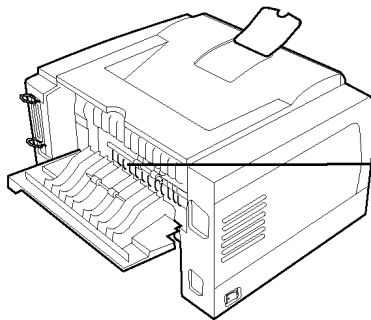
CAUTION
HOT SURFACE

Laser Scanning Unit (LSU)

DANGER	:	Invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.
CAUTION	:	Invisible laser radiation when open. AVOID EXPOSURE TO BEAM.
VORSICHT	:	Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet. NICHT DEM STRAHL AUSSETZEN.
ATTENTION	:	Rayonnement laser invisible dangereux en cas d'ouverture. EXPOSITION DANGEREUSE AU FAISCEAU.
PELIGRO	:	Cuando se abre, se producen radiaciones invisibles de láser. EVÍTESE LA EXPOSICIÓN A TALES RAYOS.
VARNING	:	Osynlig laserstrålning när denna del är öppnad. STRÅLEN ÄR FARLIG.
VARO!	:	Näkymätöntä avattaessa olet alttiina lasersäteilylle. ÄLÄ KATSO SÄTEESEEN.
VARNING	:	Osynlig laserstrålning när denna del är öppnad. BETRAKTA EJ STRÅLEN.
ADVARSEL	:	Usynlig laserstråling ved åbning. UNDGÅ UDSÆTTELSE FOR STRÅLING.
ADVARSEL	:	Usynlig laserstråling når deksel åpnes. UNNGÅ EKSPONERING FOR STRÅLEN.

PJQTB0015ZA

Laser diode properties
Laser output   : 5 mW max
Wavelength   : 785 nm
Emission duration : Continuous

Caution

This printer utilizes a laser. Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

CONTENTS

1 Introduction

1.1. Specifications

1.1.1. Printer

Specifications are subject to change without notice.

Printer	CPU	Intel 80C51 compatible 12 MHz
	Printing Method	Semiconductor Laser
	Print Speed	14 ppm (pages per minute) maximum (A4 size plain paper, simplex printing, 5% image area) 15 *1 ppm maximum (Letter size plain paper, simplex printing, 5% image area) *1 Maximum print speed is 14.6 ppm.
	First Print	15 seconds
	Resolution	600 x 600 dpi (dots per inch)
	Paper Feed	Media tray (universal cassette): up to 250 sheets of paper [75 g/m^2 (20 lbs.)] Manual feed: 1 sheet
	Paper Output	Up to 150 sheets of paper [75 g/m^2 (20 lbs.)]
	Emulation	Microsoft Windows*2 GDI
	Memory	2MB
	Operating Environment	10 to 32.5°C (50 to 90.5°F), 20 to 80% RH
	Storage Environment	0 to 35°C (32 to 95°F), 10 to 80% RH
	Warm Up Time	Less than 25 seconds [at 22°C (71.6°F), 50% RH]
	Dimensions	399 (W) x 390.5 (D) x 254 (H) mm [15.7" x 15.4" x 10"]
	Mass (Weight)	Approx. 10 Kg {22 lbs}
	Voltage	120V ± 10%
	Frequency	60Hz
	Power Consumption	Printing*3 (average): 310 W or less Stand-by (average): 70 W or less Power saving (When the fan stops): 5.5 W or less Meets ENERGY STAR® power conservation requirements. *3 Maximum print speed, duplex printing
	Noise Level	Printing : 49 dBA Standby : 37 dBA
	Density Control	Variable
	Fusing System	Heat and Pressure Rollers
	Photoreceptor	Organic Photoconductor (OPC)
	Development Process	One component non magnetic development
	Consumables/Life	Starter Toner Cartridge (provided with printer) : 2,000 pages average *4 Toner Cartridge : 4,000 pages average *4 OPC Drum Unit : 20,000 pages average *4

*2 Microsoft® Windows® operating system

*4 Average life at 5% image area with repetitive printing of 10 pages (Letter/A4 size, single sided printing, default density).
 5% image area means that the black area within the printing area is 5%. Printing 10% image area continuously will reduce the life of the toner to about half as compared to printing 5% image area.

1.1.2. Paper

Specifications are subject to change without notice.

Paper	Basic Weight	60 to 105 g/m ^{2} (16 to 28 pounds)	
	Thickness	3.7 to 7.5 mils (1 mil = 1/1000")	
	Moisture Content	4% to 6%	
	Smoothness	100 to 300 Sheffield	
	Acid Content	5.5 PH minimum	
	Fusing Compatibility	Must not scorch, melt, offset material, or release hazardous emissions when heated to 200°C (392°F) for 0.1 second	
	Cutting Dimensions	±0.0313 inch of normal, corners 90°±4°	
	Grain	Long again	
	Cut Edge Conditions	Cut with sharp blades, no paper dust	
	Ash Content	Not to exceed 10%	
	Curl	No allowable curl toward side to be printed	
	Packing	Polyaminated moisture proof ream wrap	
	Paper Size	Letter	216 x 279 mm (8.5" x 11")
		A4	210 x 297 mm (8.27" x 11.7")
		Legal	216 x 356 mm (8.5" x 14")
		B5	176 x 250 mm (6.92" x 9.84")
		Executive	184 x 267 mm (7.25" x 10.5")
		A5*	148.5 x 210 mm (5.85" x 8.27")
		A6*	105 x 148.5 mm (4.13" x 5.85")
	Envelope Size*[1]	Envelope #9	98 x 225 mm (3.87" x 8.87")
		Envelope #10	105 x 241 mm (4.12" x 9.5")
		International DL	110 x 220 mm (4.33" x 8.66")
		International C5	162 x 229 mm (6.38" x 9.01")
		Monarch	98 x 191 mm (3.87" x 7.5")

*[1] Duplex printing cannot be performed with A5, A6 size paper or envelope.

Types of paper to avoid.
- Extremely smooth or shiny paper or paper that is highly textured
- Coated paper
- Acid paper
- Letterhead imprinted with low temperature or thermography. These materials may transfer onto the fusing roller and cause damage. Any pre-printed paper should use inks compatible with 200°C (392°F) for 0.1 second.
- Damaged or wrinkled paper, or paper with irregularities such as tabs, staples, etc.
- Multipart forms or carbonless paper
- Paper with a cotton and/or fiber content over 25%
- Ink jet media (paper, transparency, etc.) (It may transfer onto the fuser unit's roller and cause damage.)

1.1.3. Interface, Options, Accessories, and Supplies

	Parallel (Bi-directional)	Connector Type	IEEE P1284-B (36PIN Anphenol) Connector
Interface		Cable	Use a shielded cable 2 meters (6.6 feet) or less in length
	USB	Connector Type	"B Type" Connector
		Cable	Use a full-speed shielded cable 5 meters (16.4 feet) or less in length
Options, Accessories, and Supplies	KX-PDP7		Toner Cartridge (4,000 page life)
	KX-PDM7		OPC Drum Unit (20,000 page life)

Specifications are subject to change without notice

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1.1.4. Others

1.1.4.1. About Media

Available Media and Media Size

Media	Media size	Media tray	Manual feed	Duplex print
Paper Cotton paper	Letter	○	○	○ *1
	A4	○	○	○ *1
	Legal	○	○	○ *1
	B5	○	○	○ *1
	Executive	○	○	○ *1
	A5	○	○	X
	A6	○	○	X
Available media size*2	Max.	216 X 356 mm (8.5" X 14")	216 X 356 mm (8.5" X 14")	216 X 356 mm (8.5" X 14")
	Min.	105 X 148.5 mm (4.1" X 5.9")	76.2 X 127 mm (3" X 5")	182 X 257 mm (7.2" X 10.1")
Transparency	Letter	○	○	X
	A4	○	○	X
Label	Letter	X	○	X
	A4	X	○	X
Envelope	#9	○	○	X
	#10	○	○	X
	Monarch	○	○	X
	DL	○	○	X
	C5	○	○	X

○ : supported   X : not supported

*1 Cotton paper cannot be used for duplex printing.

*2 When printing a document on a custom size paper, print it using the application software that page size can be set to a custom size. At that time set the paper size to letter or A4 for the printer's media size setting.

Available Paper Weights and Capacity

	Media	Media tray	Manual feed	Duplex print
Paper weights	Plain paper	60 - 105 g/m² (16 - 28 lbs.)	60 - 105 g/m² (16 - 28 lbs.)	75 - 90 g/m² (20 - 24 lbs.)
	Thick paper	X	106 - 165 g/m² (29 - 44 lbs.)	X
	Envelope	90 g/m² (24 lbs.)	90 g/m² (24 lbs.)	X
Paper capacity	Paper	250 sheets [75 g/m² (20 lbs.)]	1 sheet	
	Transparency	20 sheets	1 sheet	
	Label	X	1 sheet	
	Envelope	30 sheets	1 sheet	

Recommended Media

Media	Media size	Recommended media
Paper	Letter	Xerox 4024 DP paper 75 g/m^2 (20 lbs.)
	A4	Xerox paper 80 g/m^2
Transparency	Letter / A4	3M CG3300
Label	Letter	Avery 5160 – 5163, Avery 5660 – 5663
	A4	Avery L7159 – L7164
Recycled paper*^{1}	Letter	Multi Use 20 lbs., 24 lbs.
	A4	——

*^{1} When using the recycled paper, select Paper for Media Type on the Page Setup tab.

Transparency:

· To avoid damaging the printer, do not use ink jet transparency.

· Transparencies and adhesive material of labels should be stable at 205°C (400°F), the printer's maximum temperature.

· Re-using transparencies that have been fed through the printer once (for example, after jams or if the transparency is ejected without being printed) can reduce the life of the consumables and paper path components.

· When using transparencies, if the print quality is poor, print on the other side.

Labels:

· With any label stock, the labels must completely cover the backing material.

Envelope:

It is recommended that you purchase only high quality envelopes with diagonal seams, as shown in the diagram below:
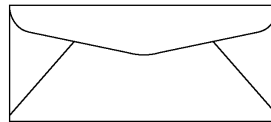
High quality envelopes have the following characteristics:

· A thin, sharply creased leading edge

· Paper weight of 90 g/m^2 (24 lbs.)

· Flat, free of curls, wrinkles, nicks, etc.

Note:

Wrinkles may occur, even when using high quality envelopes.

1.1.4.2. Margins and Print Area

The image (print area) is printed a bit smaller than the media size. 4.2 mm (0.17") is required for top, bottom and side margins. It may be needed to adjust the page margins in the application software to match the allowable printarea.

(Envelope)

4.2 mm (0.17")   4.2 mm (0.17")   4.2 mm (0.17")

4.2 mm (0.17")   4.2 mm (0.17")   4.2 mm (0.17")

10.0 mm (0.39")

4.2 mm (0.17")   4.2 mm (0.17")

8
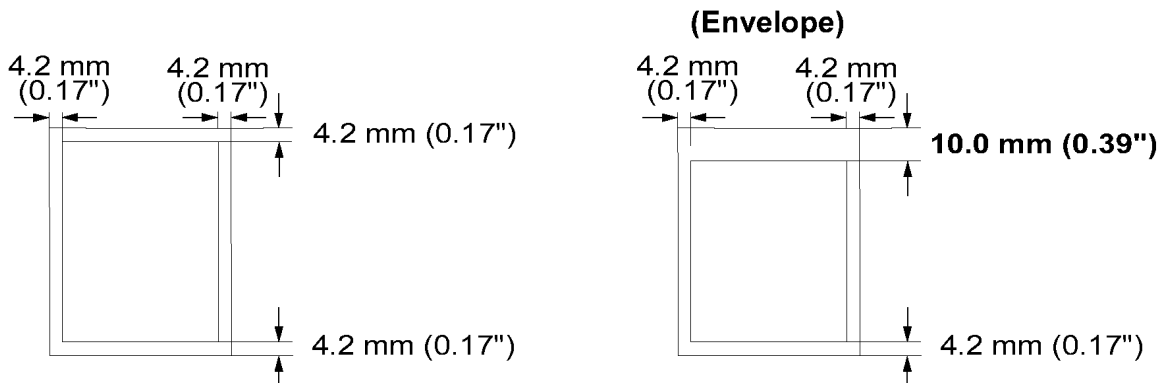
1.2. Indicators

1.2.1. Printer Panel
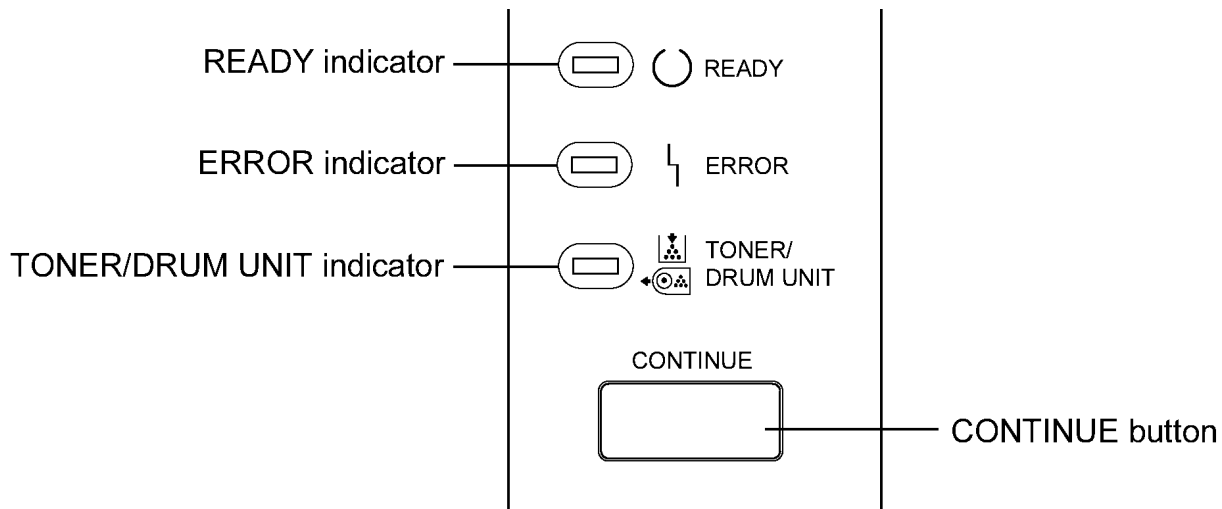
1.2.2. Indicators / Button

Three indicators show the following printer's status.

For detailed information on the printer status and recovery, see Section 9.1.

READY	ERROR	TONER/ DRUM UNIT	Printer Status
■	■	■	Printer is warming up (three indicators light one after another).
■	▢	▢ *	Printer is ready for printing or in the sleep mode.
▢	■	▢	Internal Error occurs. - - ->Turn the printer off and back on again. If the problem persists, service by an Authorized Panasonic Center is required.
☀	▢	▢ *	Printer is receiving data or data remains in printer's memory.
▢	☀	▢	Printer recoverable errors (media jam, media empty, etc.) occurred.
▢	☀	■	Toner is empty.
			Drum unit is not installed in the printer.
			Life cycle of the drum unit has expired.
			Life cycle of the drum unit has expired and toner is empty.
▢ *	▢	☀	Drum unit is wearing out.
			Toner is low.

■ : on

▢ : off

☀ : blinking fast (with an interval of 1 second)

* The status is varied depending on the condition.

Button	⏻ READY	┗ ERROR	TONER/ DRUM UNIT	Printer Status
CONTINUE	▬ (on)	▭ (off)	▭ (off)	Printer wakes up from the sleep mode (power save mode) by pressing this button for less than 5 seconds.
	▭ (off)	▨ (blinking fast)	▭ (off)	Printer recovers from the error status after paper empty or paper feed error is restored by pressing this button for less than 5 seconds.

▬ : on

▨ : blinking fast (with an interval of 1 second)

▭ : off

1.3. Parts Identification

1.3.1. Front Side View

Paper Support

Output Tray

Left Cover

Right Cover

Front Cover

Manual Feed

Printer Panel

Paper Cassette
(Media Tray)

Paper height indicator

1.3.2. Rear Side View

Parallel Interface
Connector

Rear Cover
(Paper Cover)

USB Interface Connector

Jam Release Pan

Power Switch

AC Inlet

1.4. Component Layout and Paper Path

Fuser Unit

OPC Drum Unit

(Paper Output Tray)

LSU (Laser Scanning Unit)

Paper Switchback Roller

Heat Roller

Toner Cartridge

**Manual Feed
Paper Guide**

Paper Switchback
Guide

Paper Exit/ADU
Paper Jam Sensor

Manual Feed
Paper Path

(Duplex Paper Path)

Media Tray
Paper Path

(Paper Path)

OPC Drum

Paper Feed Roller

Transfer Roller

Pickup Roller

ADU Paper Feed Roller

Registration Sensor

Registration Roller

Paper Top Sensor

1.5. Electrical Components and Sensor Boards

Main Controller Board

Paper Exit/ADU Paper Jam Sensor Board

High Voltage Board

Power Supply Board

Paper Top Sensor

Toner Empty Sensor Board

Registration Sensor

Indicator Board

Registration & Paper Top Detection Sensor Board
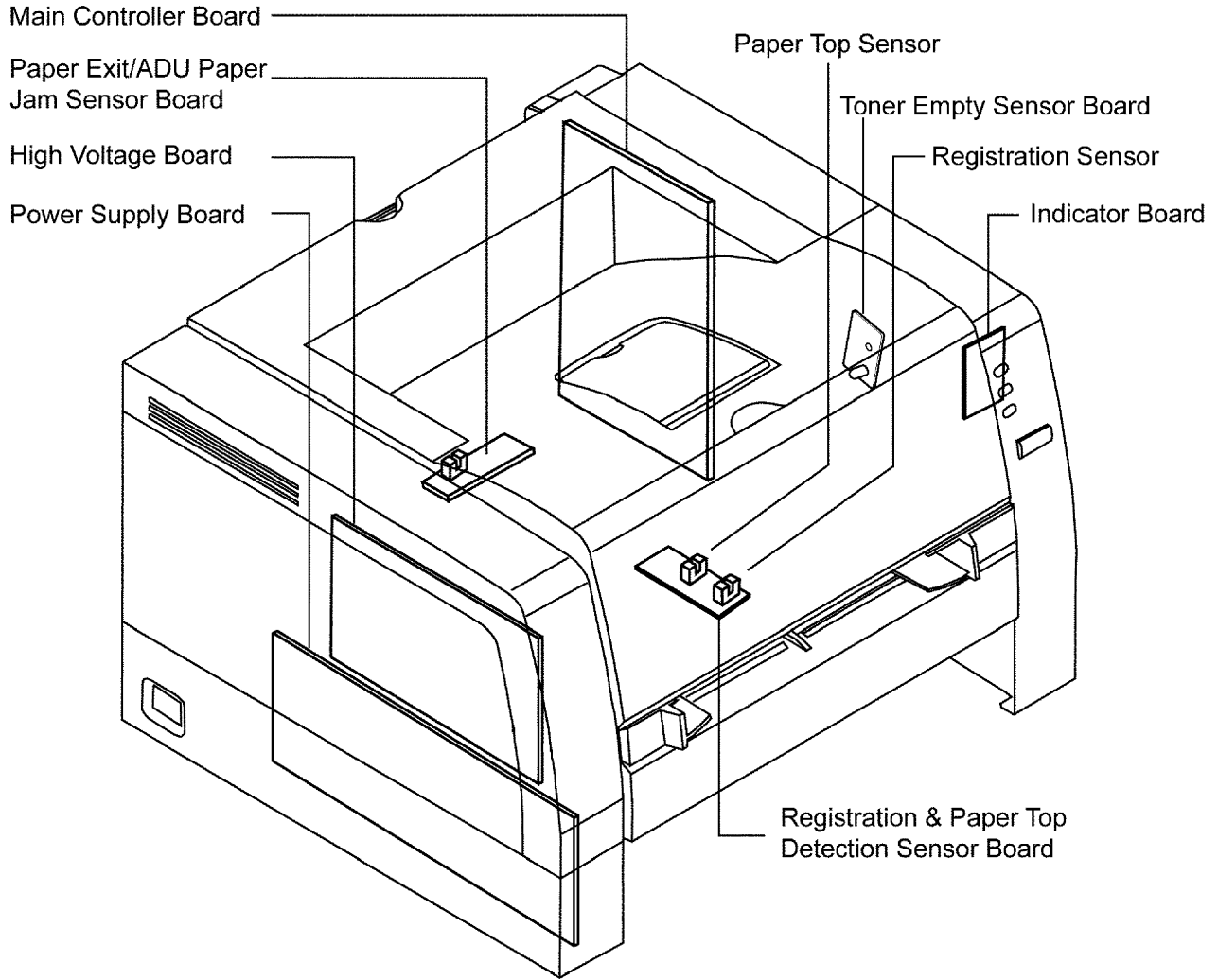
1.6. Switches and Solenoids

Switchback
Solenoid

OPC Drum Unit
Interlock Switch

Front Door Safety
Interlock Switch

Registration
Solenoid

(LSU)

(Toner Cartridge)

(Fuser Unit)

(OPC Drum Unit)

(Pickup Roller)

Main Stepping Motor

Pickup Solenoid

1.7. Print Process

Doctor Blade

OPC Drum

1.7.1 Charge
(Charge Corona)

1.7.5 Fusing
(Heat Roller)

Toner Supply
(Roller)

1.7.2 Exposure
(LSU)

Development
(Toner Area)

Paper Path

Fusing Pressure (Roller)

1.7.4 Transfer (Transfer Roller)

Paper Pickup (Roller)

1.7.3 Development / Cleaning
(Conductive Roller)

1.7.1. Charge

The charge corona applies a high, uniform positive charge to the surface of the organic photoconductor (OPC) drum. The charge level is approximately 900 VDC and remains because the OPC drum has a high electrical resistance when concealed in darkness.

1.7.2. Exposure

The laser beam passes through the collimator lens, is reflected by the polygon mirror, and is focused onto the drum after passing through an image-forming ($f-\theta$) lens and a reflectionmirror. Wherever the laser beam strikes the drum, the positive charge dissipates. A latent electrical image of two different voltages potentials, which corresponds to the original page, is formed on the OPC drum.

1.7.3. Development / Cleaning

Development:

Non-magnetic toner is supplied to the conductive roller by the toner supply roller. The toner on the conductive roller is positively charged by friction with the toner supply roller, and the doctor blade ensures a thin layer on the surface of theconductive roller. Wherever the conductive roller touches the drum, the positively charged toner is attracted to the latent image on the drum, and the latent image is converted to a visible toner image. A bias voltage of approx. 350 VDC is appliedto the conductive roller to achieve maximum print quality.

Cleaning:

After transfer, residual toner remains on the drum surface, and for next printing, the residual toner reaches to the development area via charge and exposure. The charge level of the OPC corresponds to the white background is +900VDC, andthe bias voltage of the conductive roller is approx. +350VDC. Therefor the positively charged residual toner on the OPC drum is attracted and collected to the conductive roller. The charge level of OPC after exposure is +100VDC. So,the printing area of the OPC is cleaned.

1.7.4. Transfer

As the paper is fed between the drum and the transfer roller, a high negative charge is applied to the back of the paper. The positive toner particles are then attracted from the drum surface to the paper. After transfer, the paper is separatedfrom the drum surface by the curvature of the drum.

1.7.5. Fusing

The paper passes through the fuser rollers and is subjected to heat and pressure. The fusing temperature is approximately 190°C (382.5°F), and the pressure is approximately 0.36kg/cm (3.53N/cm). This bonds,or fuses, the toner into the paper.

1.8. Paper Feed

Media Tray

The main motor drives the pickup roller after the pickup solenoid is energized, which engages the pickup roller clutch and feeds a sheet of paper. The paper is pushed to the paper feed roller, which overdrives the paper slightly causing a buckleto ensure the paper is aligned with the stationary registration roller.

While triggering the registration sensor notifying the CPU paper is ready to feed. The paper at this point is the same as manual feed.

Manual Feed

when paper is inserted, it activates the registration sensor. At the porter time, the CPU energizes the registration solenoid that allows the registration roller to rotate, feeding paper to the top sensor.
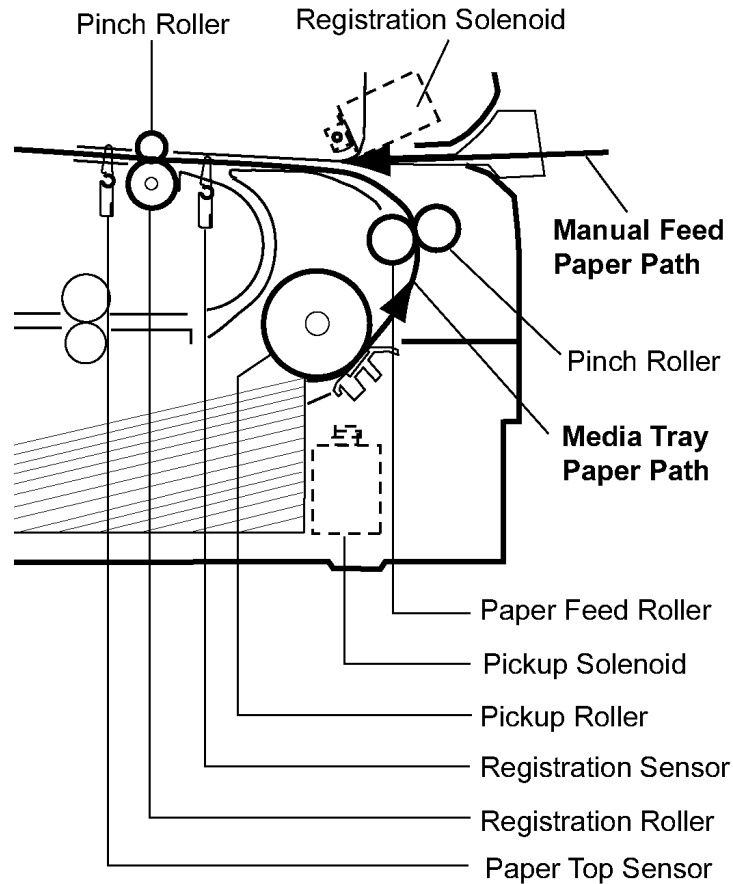
1.9. Laser Scan Unit (Exposure)

1.9.1. Operation Theory
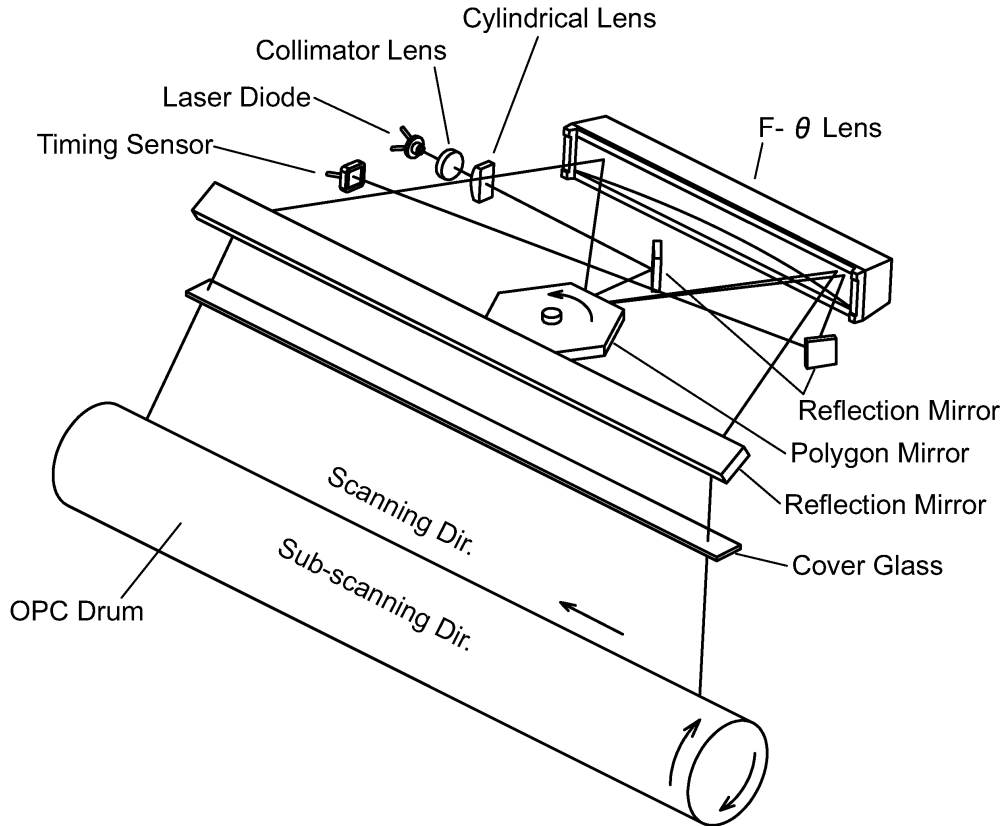
The light beam from the laser diode (light source) is modulated by the digital signal (nVIDEO) and converted to parallel light waves by the collimator lens. The beam is then sent to the rotating polygon mirror (polygon scanner), where it is reflected through the $f-\theta$ lens and then focused onto the OPC drum surface. The diameter of the beam is about 80 μm, and the light moves across the surface of the OPC drum in the scanning direction of right to left. As the drum rotates (sub-scans), a static image is formed where the laser beam touches the drum surface.

The laser beam is also deflected to the timing sensor. This sensor controls the start timing of scanning on the drum, providing a consistent left margin. The CPU uses the timing sensor to detect abnormal signals.

1.9.2. Laser Beam

The laser beam is pulsed on and off by the digital signal (nVIDEO) to form a latent image of two different voltage potentials on the drum, as shown below.

Turn Laser Beam ON and OFF corresponding with the images.

● : Laser Beam-"ON" (Drum discharged)

○ : Laser Beam-"OFF"
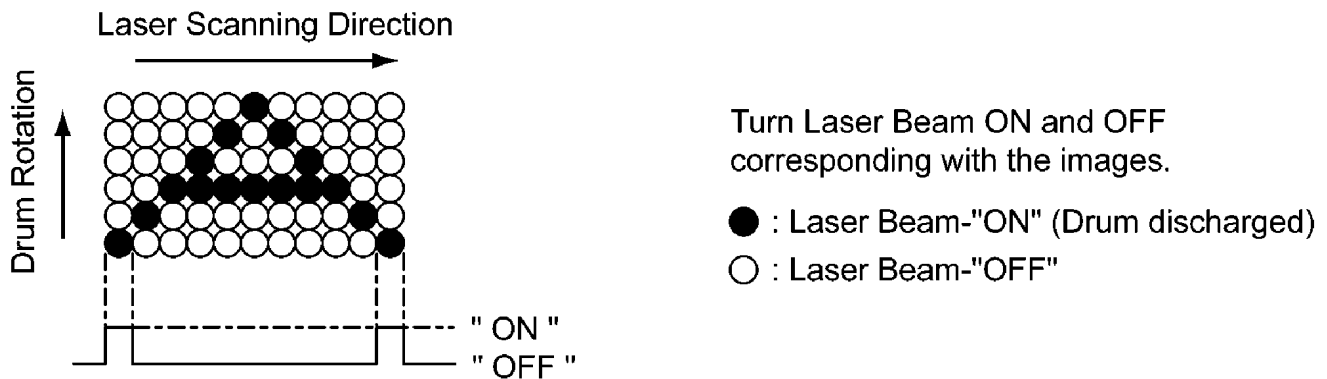
Laser Diode Specification

Item	Minimum	Standard	Maximum	
Oscillation Wavelength	770	785	800	nm
Output Light Power (OPC Drum Surface)	0.315	0.350	0.385	mW

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1.9.3. Collimator Lens

The collimator lens converts light from the laser diode to parallel light. This aids in scanning and provides better convergence to a dot.

Collimator Lens
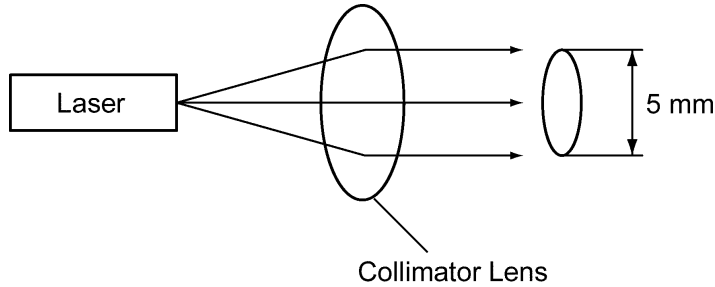
1.9.4. Polygon Scanner

The polygon scanner consists of a 6-sided mirror directly driven by a brushless DC motor at a rate 20,078.74 rpm. The laser beam is reflected across the OPC drum by the mirror faces and produces the scan. One mirror face is equal to one main scan. This unit features stable line scanning speed, precision mirror surface reflection angle, reflect-free surfaces, and instant start.

Polygon Scanner Specifications

Item	Specification	
Mirror	6	faces
Revolution	20,078.74	rpm

1.9.5. Cylindrical Lens and f-Θ Lens

Each of the polygon mirror surfaces has a slight imperfection. This prevents the beam from scanning the OPC drum surface at the constant interval in the sub-scan direction. The cylindrical lens and f-Θ lens are used for correcting this uneven laser scanning.

1.9.6. f-Θ Lens

This lens ensures that the beam scans across the surface of the OPC drum at a constant rate. The beam is refracted to parallel light as it passes through the lens to ensure that the dots at the edge of the drum and at the center of the drum areequally spaced. This lens also provides a set focal length for laser beam.

f-Θ

Specifications

Item	Specification	
Scanning Width	207.43	mm
Focusing Light Spot Size	80 x 90	μm

1.9.7. Timing Sensor

This sensor detects the laser beam and determines the start timing for scanning. A pin photodiode is used as the timing sensor.

Signals detected by the timing sensor
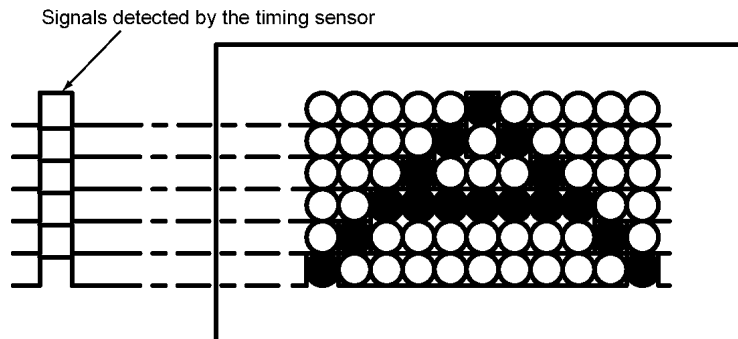
1.10. Fuser Unit
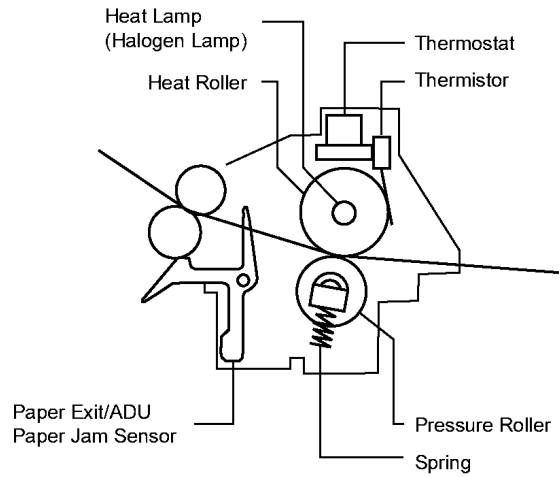
A 600W heat lamp (halogen lamp) heats the surface of the teflon-coated heat roller to approximately 190°C (374°F), a thermistor monitors the heat roller temperature, and the CPU controls the ON/OFF timing of the lamp.

The thermostat is mounted 2.5mm away from the heat roller. If the ambient temperature reaches 180°C (356°F), the thermostat is opened, and power is removed from the heat lamp. The surface of the thermostat is not as hot as thatof the heat roller. When the thermostat opens, the surface of the heat roller may reach 200°C (382°F), and the system displays E30. If the thermistor opens, the system displays E32. If by chance the thermostat malfunctions a thermalfuse opens.

The pressure roller is kept in contact with the heat roller through 2 pressure springs, which apply a pressure of approximately 0.36 kg/cm (3.56 N/cm). Drive is supplied from the main motor via intermediate gears.

1.11. Paper Ejection and Paper Switchback

A. Normal Printing Mode (Not Duplex Mode)

After fusing, paper is fed to the output tray by the switchback roller and switchback pinch roller. The paper exit/ADU paper jam sensor detects paper. If paper does not arrive at the sensor within a predetermined period of time, "Jamat A" is displayed, and if paper remains at the sensor beyond a predetermined period, "Jam at B" is displayed on the computer screen. Paper is ejected face down and stored in the output tray.
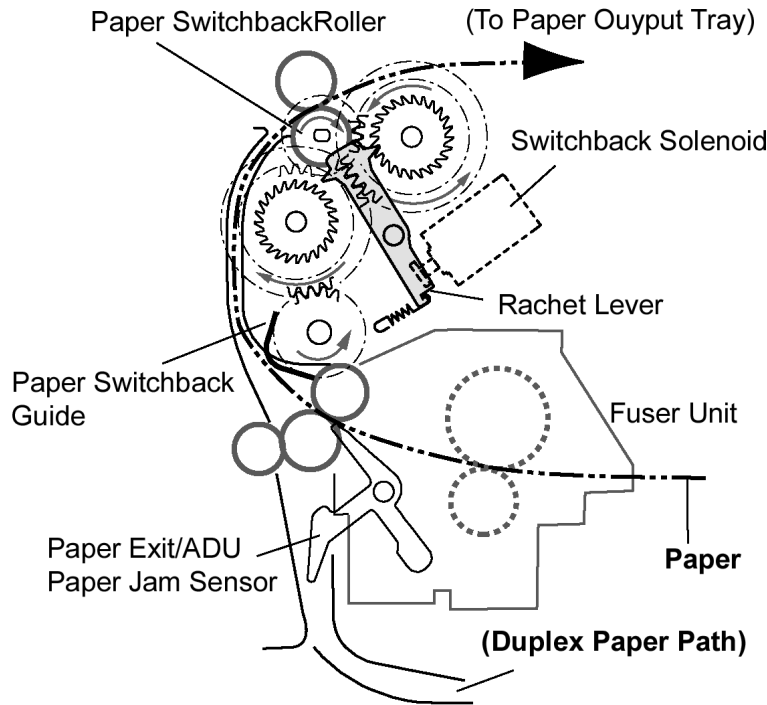
B. Duplex Mode

After fusing, paper is fed to the output tray by the switchback roller and switchback pinch roller. The paper exit/ADU paper jam sensor detects paper. If paper does not arrive at the sensor within a predetermined period of time, "Jamat A" is displayed on the computer screen. At the specified time after the sensor detects the bottom of paper, the switchback roller rotates in reverse direction, turning on the switchback solenoid to move the ratchet lever to Duplex Position.As a result, the paper is fed to the development area through the Auto Duplex Unit (ADU) (see section 1.4 Component Layout and Paper Path). If paper remains at the sensor beyond a predetermined period, "Jam at E" is displayed.Paper is ejected face down and stored in the output tray.
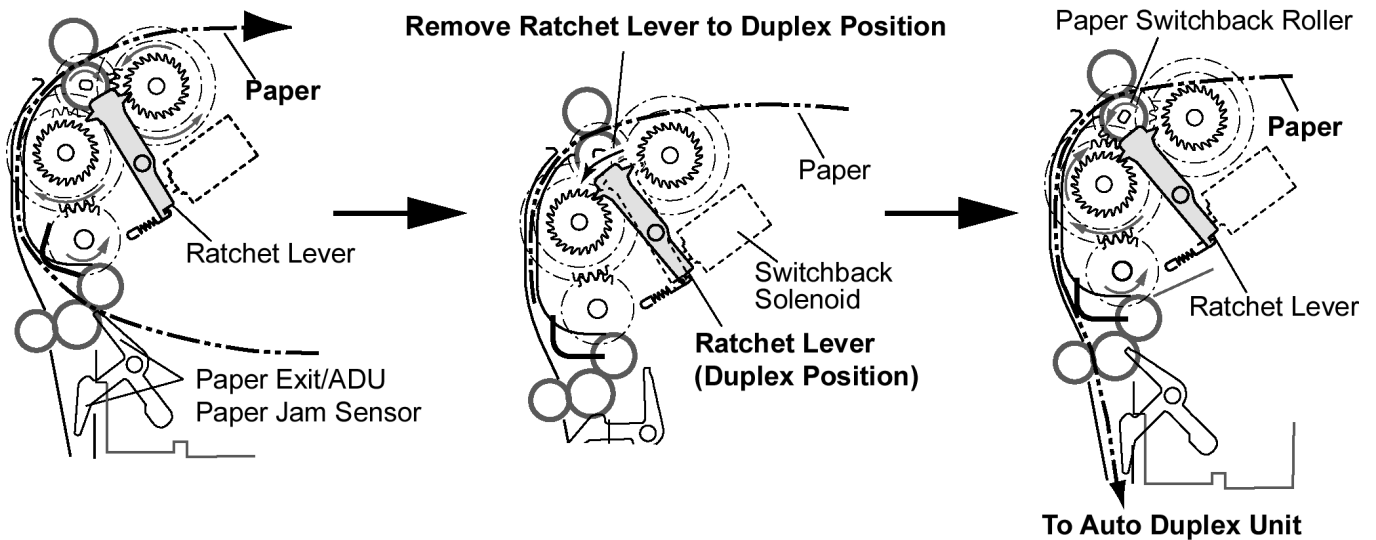
2 Installation, Setup, and Repacking

2.1. Installation Requirements

2.1.1. Environment

1. Temperature Range :10 °C - 32.5 °C (50 °F - 90.5 °F) (Temperature fluctuation ± 10 °C per hour or less)

2. Humidity Range :20% RH - 80% RH (Humidity fluctuation ± 20 °C per hour or less)

3. Printer Weight :10 kg (22 lbs.)

4. Place the unit on a stable, level surface.

5. Do not install the unit under the following conditions.

   a. Extremely high or low temperature

   b. Extremely high or low humidity

   c. Direct exposure to sunlight

   d. Areas of high dust concentration

   e. Areas of poor ventilation

   f. Areas exposed to chemical fumes

   g. Areas with extreme vibration

   h. Directly in air conditioning flow

2.1.2. Ventilation Requirements

Ventilation space is needed around the printer, more than 20 mm (0.8") between the printer and a wall.

2.2. Setup

2.2.1. Removing the Packing Material

1. Remove the printer from the plastic bag.

2. Remove all adhesive tape from the printer.

Note:

Please do not throw away the packing materials. They may be required to ship or transport the printer. To provide optimum print quality, the unit must be kept upright and level at all times.

2.2.2. Installing the Toner Cartridge and Drum Unit

(1)   Shake the toner cartridge.

(2)   Remove the shipping cover.
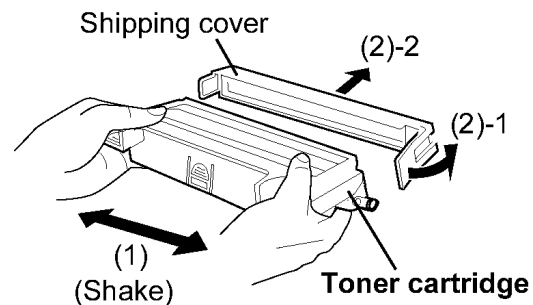
(3)   Remove the protective sheet from the drum unit.
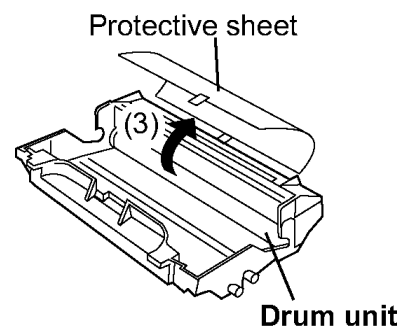
(4)   Slide the side pins of the toner cartridge into the drum unit.

Toner cartridge

(4)

Side pin
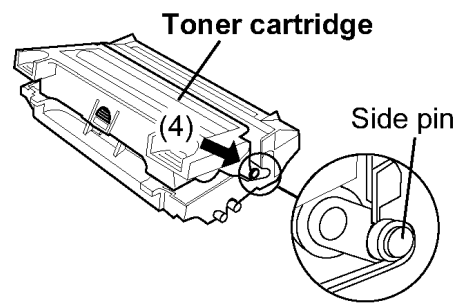
(5)   Push down the toner cartridge as shown to lock in place.

Note:

To prevent any damage to the drum unit,
- Do not touch the black drum surface (A).
- Do not expose to light for more than 5 minutes.
- Do not expose to direct sunlight.

(A)

(5) Push down

(5)
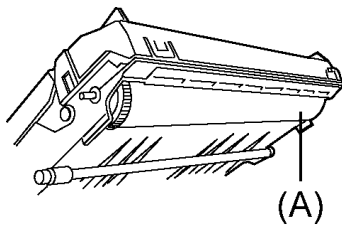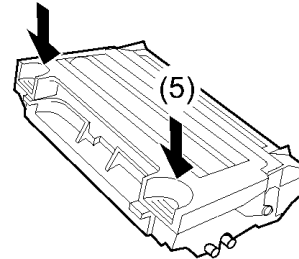
(6)   Open the front door.

(7)   Insert the drum unit into the printer [insert the side pins of the drum unit into the groove (label ➡)].

(7)

(6)

Side pin
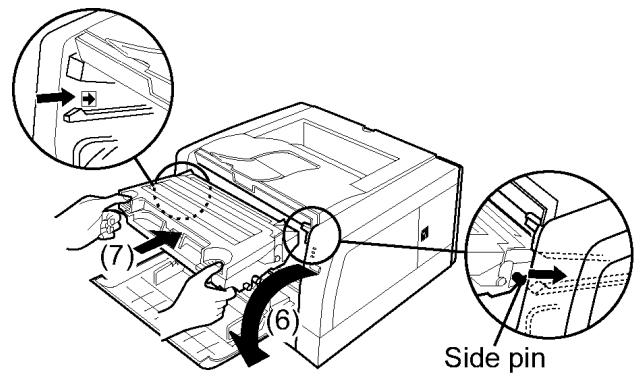
(8)   Push down as shown to lock in place.

(9)   Close the front door.

Push down (8)

(8)

(9)

23
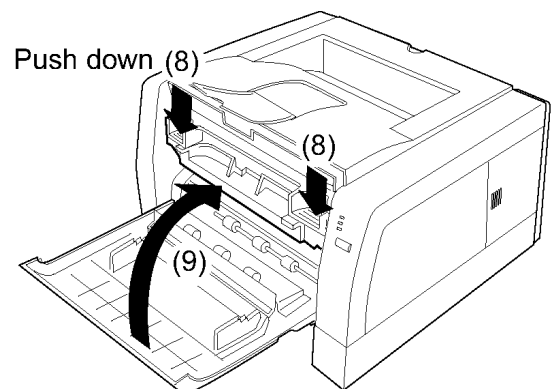
2.3. Repacking

Prepare the unit before shipping.

Note:

It is highly recommended that users keep the original carton and **ALL** packing materials. Please follow these instructions when transporting or shipping the printer.

· The printer weights about 10 kg {22 lbs}.

· Please use the original carton and all of the original packing materials.

· Improper repacking of the printer may result in a service charge to remove spilled toner.

· Since the printer uses dry toner, extreme care must be taken when handling. The printer should be handled in the upright (vertical) position.

· Do not ship with drum unit installed in printer.

 Material Required

· Original cartons and packing materials

· Newspaper or drop cloth

· Shipping tape and scissors

(1) Turn off the printer, remove the power cord and all interface cables.

(2) Open the front cover.
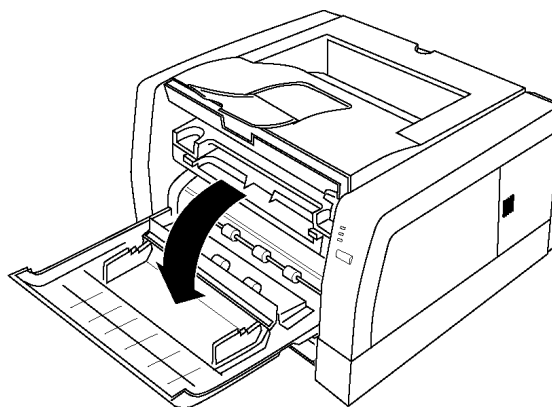
(3) Lift the drum unit up (1) and slide it out of the printer (2).

· To avoid possible toner spillage, it is recommended to place the drum unit on newspaper or a drop cloth.

 Caution:

 – To prevent any damage to the drum unit, observe the following precautions;

 – Do not touch the black drum surface illustrated below.

 – Do not expose the drum unit to light for more than 5 minutes.

 – Do not expose the drum unit to direct sunlight.

 – Do not keep the drum unit near dust or dirt.

 – Do not place the drum unit in a high humid area.
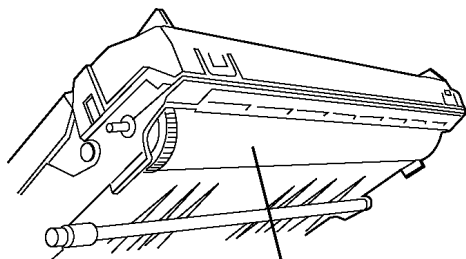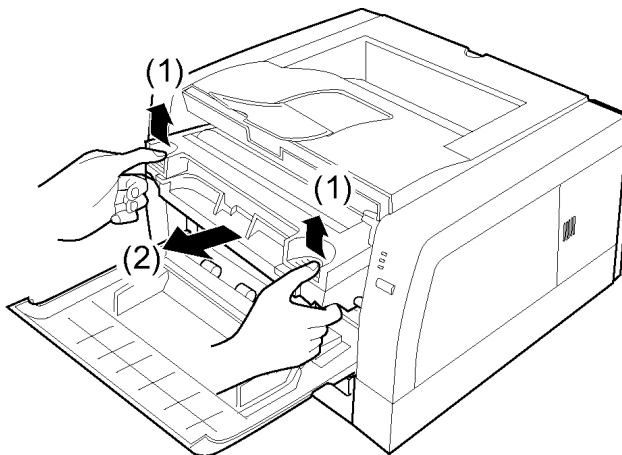
Black drum

(4) While pushing the drum unit (1), lift the toner cartridge up (2).
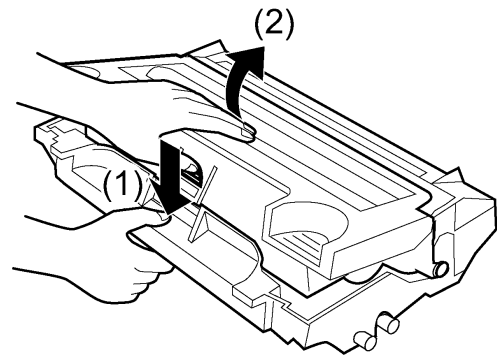
(5) Replace the shipping cover on the toner cartridge.
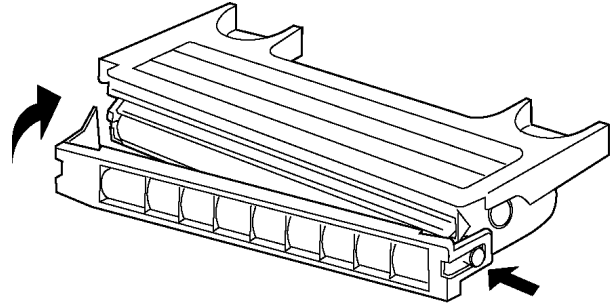
(6) Insert the toner cartridge into a plastic bag (1) and seal the end of the bag tightly (2,3).
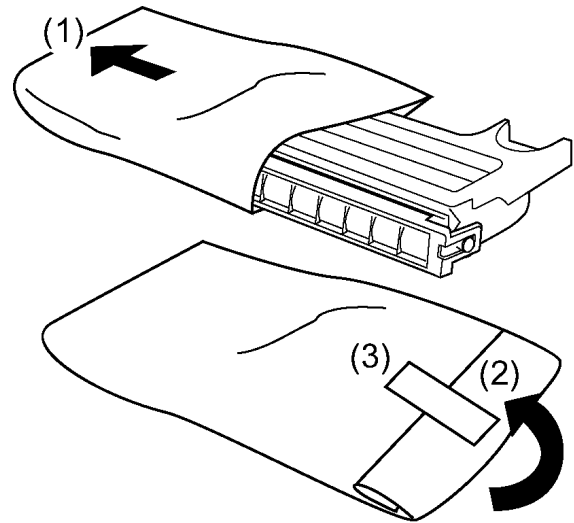
(7) Wrap the drum unit with the protective sheet to protect the drum surface.
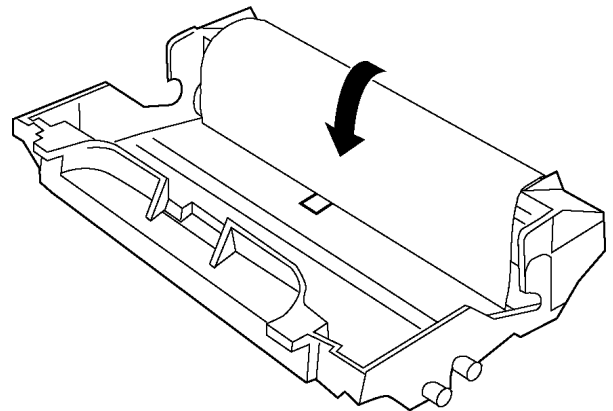
(8)   Insert the drum unit into a plastic bag and seal the end of the bag tightly.

(9)   Wipe off any loose toner in and around the printer.
  Note:

> · If a toner vacuum is available, it is the best tool for cleaning spilled toner. Do not use a standard office vacuum; the toner **will not** be retained by typical vacuum dust collectaors.

(10) Close the front cover.

(11) Repack the printer in box as shown.
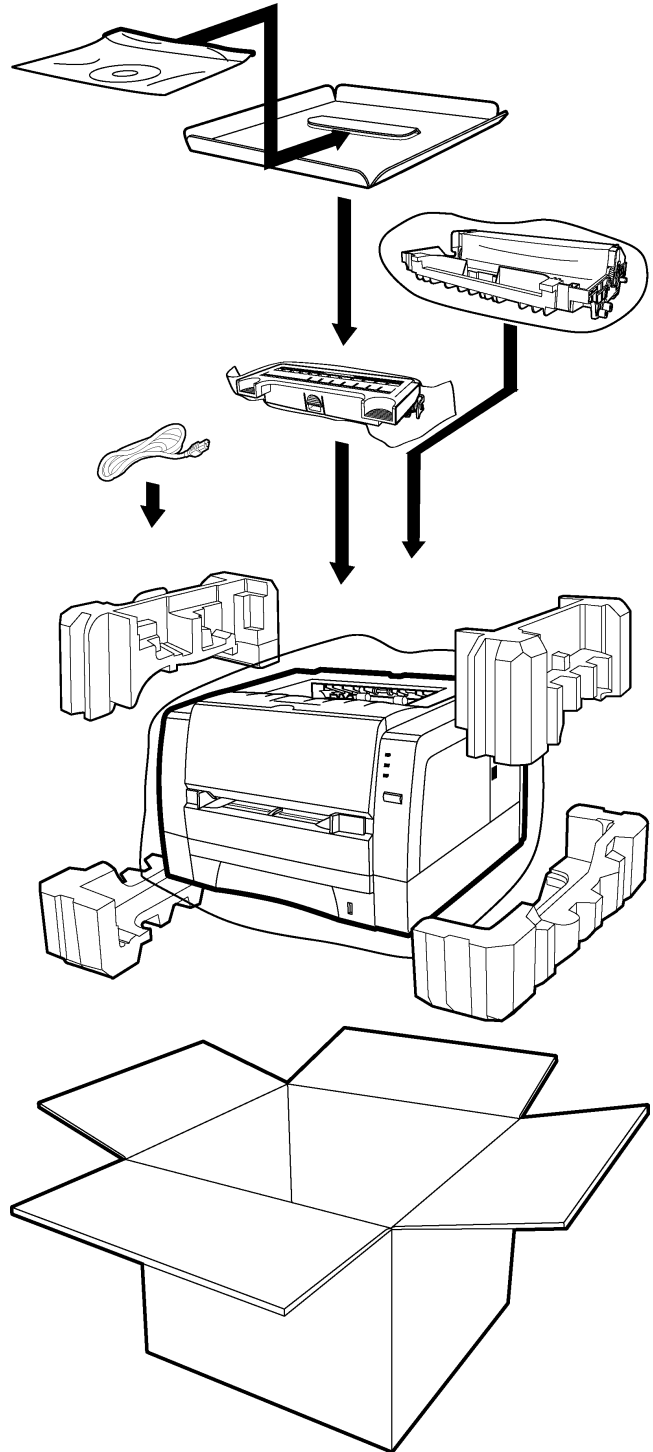
3 Removal and Replacement Procedures

3.1. Front and Rear Covers

(1) Remove the Front Cover by releasing the hooks.

Hook
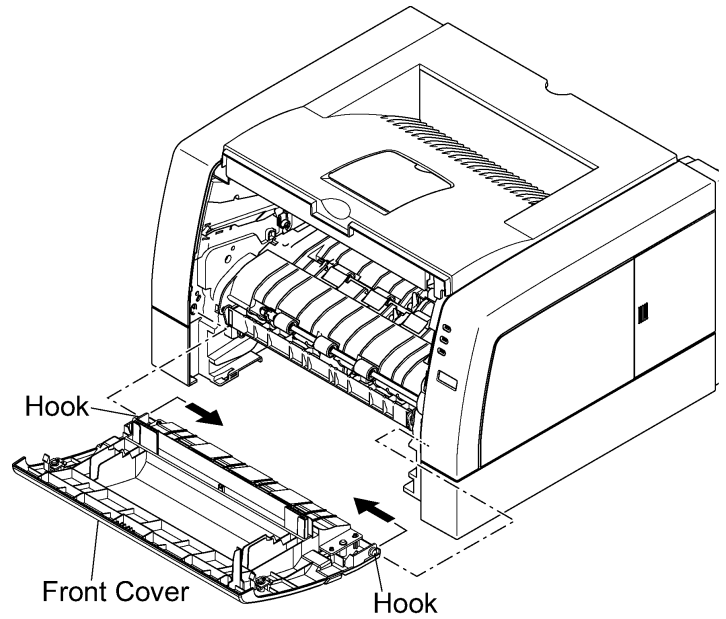
Front Cover

Hook

(2) Remove the Rear Cover by releasing the hooks.

Hook
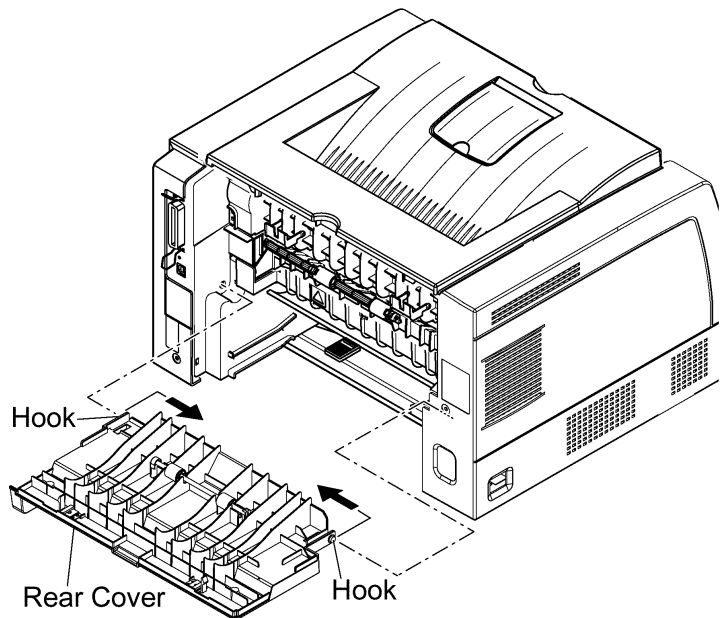
Rear Cover

Hook

3.1.1. Front Cover Disassembly

(1) Remove the Pinch Roller Holder Assembly (2 screws).

(2) Remove the Paper Guide Pinion Gear (1 screws).

(3) Remove the Guide Racks (2 screw).

Pinch Roller X 2

Pinch Roller Spring X 2

Screw

Cleaning Roller

Front Cover

Cleanin Roller Spring

Paper Guide (L)

Screw

Pinch Roller Holder

Screw

Guide Rack

Paper Guide (R)

Paper Guide Pinion Gear

Guide Rack
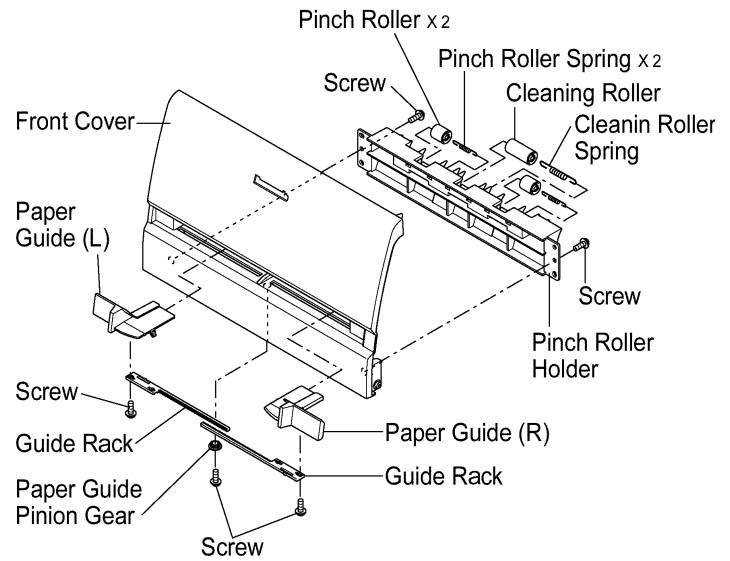
Screw

3.1.2. Rear Cover Disassembly

(1) Release the Shaft from the hook by pushing the shaft support in the arrow direction.

(2) Separate the Shaft, 2 Rollers and 2 Springs.

Shaft Support

Rear Cover

Spring

Shaft

Roller

28
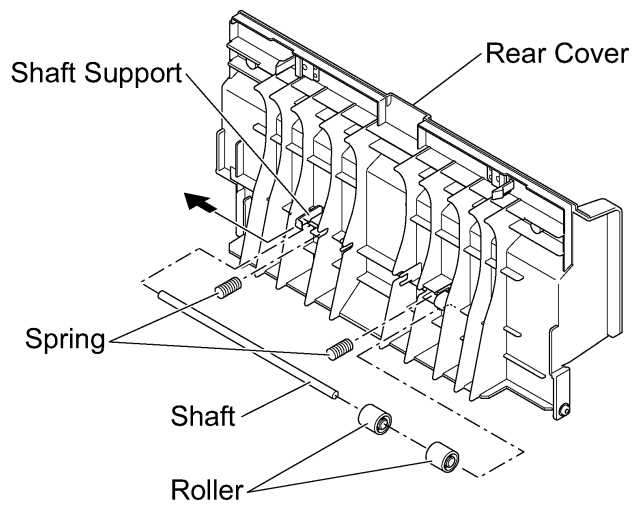
3.2. Right, Left and Top Covers

3.2.1. Right Cover

1. Remove the screw.
2. Release the 2 hooks from the bottom side of printer.
3. Remove the Right Cover.
4. Remove the LED Indicator Cover and Continue Button (1 screw).

3.2.2. Left Cover

1. Remove the screw.
2. Release the 2 hooks from the bottom side of printer.
3. Remove the Left Cover.

3.2.3. Top Cover

1. Release the 2 hooks from both sides of the printer.
2. Remove the Top Cover.
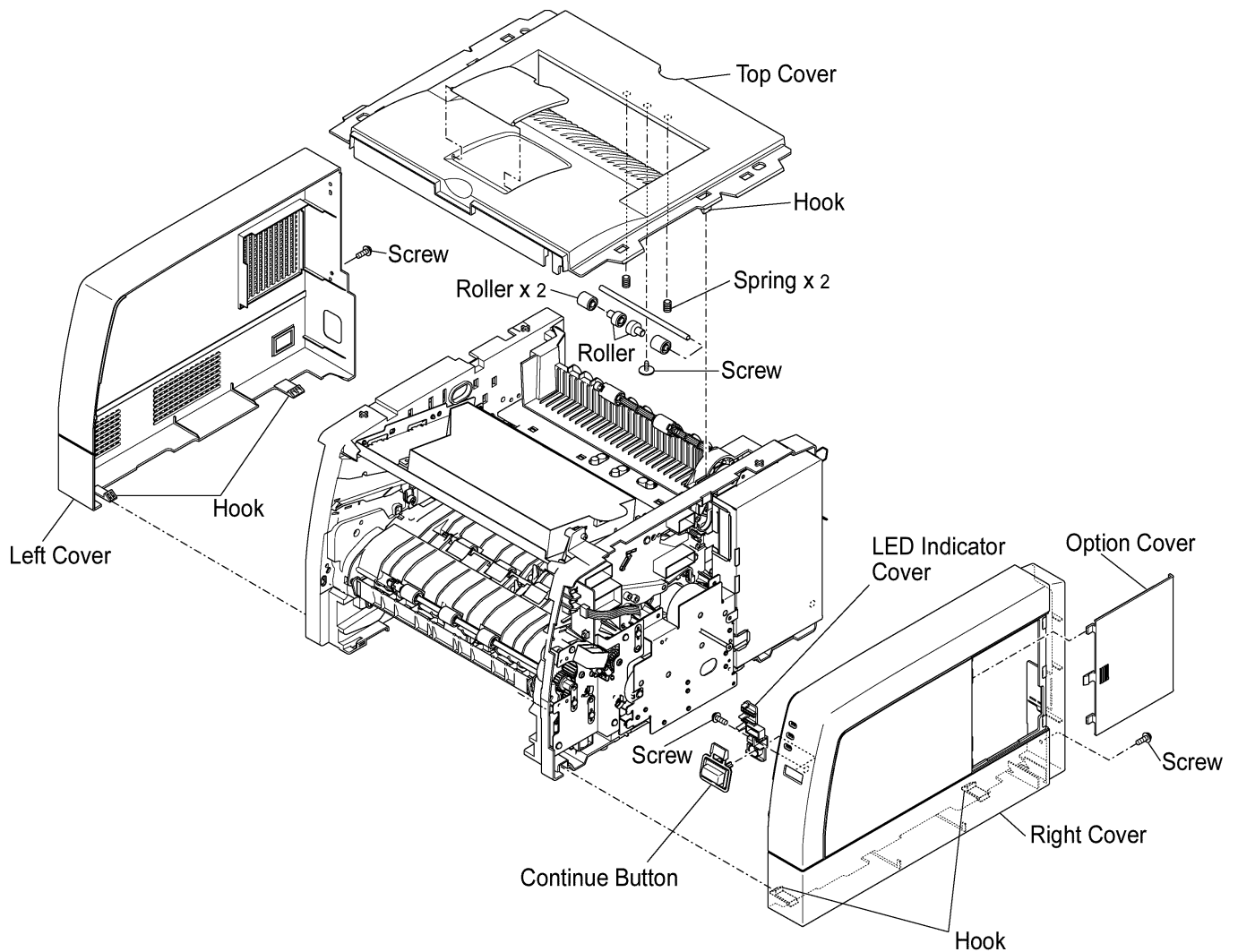
3.3.   Laser Scanning Unit (LSU)

Before handling, remove the Right, Left and Top Covers (see Section 3.2).

(1)   Remove the 3 screws.

(2)   Disconnect the 2 connectors from the LSU.
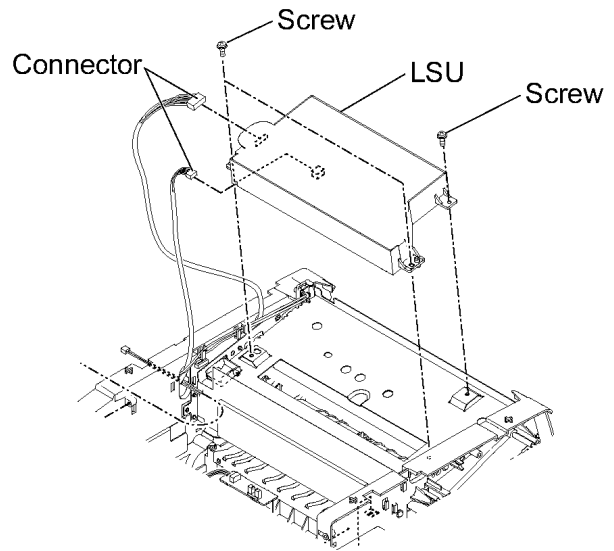
3.4.   Relay Board (B)

Before handling, remove the Left Cover (see Section 3.2).

(1)   Remove the connector from the Relay Board (B).

(2)   Remove the 2 screws.

(3)   Remove the Relay Board (B).

30
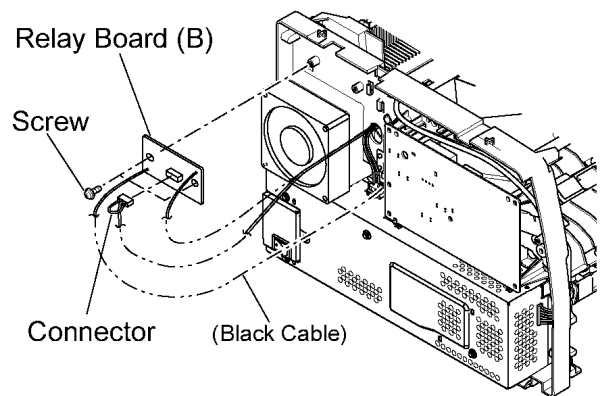
3.5. High Voltage Board and Power Supply Unit

Before handling, remove the Left Cover (see Section 3.2).

3.5.1. High Voltage Board

(1) Remove the screw (A) and 5 screws (B).

Caution :

Screw (A) is different from screws (B). When reinstalling the screw, return it to the original position.

(2) Disconnect the Flat Cable from the High Voltage Board.

(3) Remove the High Voltage Board, be careful that High Voltage Terminal Springs are not dropped from the printer and lost.

Terminal Spring x 5

Flat Cable

Screw (B)

Screw (A)

Screw (B)

High Voltage Board   Connector
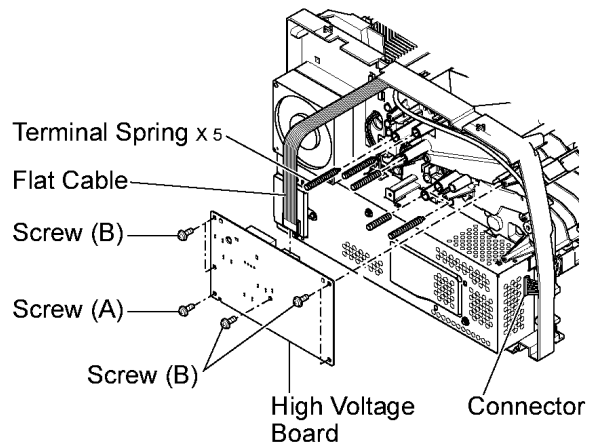
(4) Remove the 5 High Voltage Terminal Springs.

Caution :

When reinstalling the High Voltage Terminal Springs, all springs must be returned to the original position. And the hook of Spring (A), (D), (E) are set into the slits as shown in the following figure.

Hook   Slit

Terminal Spring (E)
Terminal Spring (A)
Terminal Spring (B)
Terminal Spring (C)
Terminal Spring (D)

Teaminal Spring (A)

Long Hook

Teaminal Spring (B)

Teaminal Spring (C)

Short Hook

Teaminal Spring (D)

Teaminal Spring (E)

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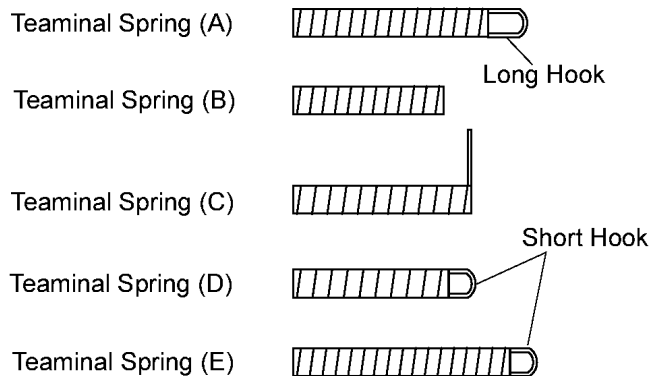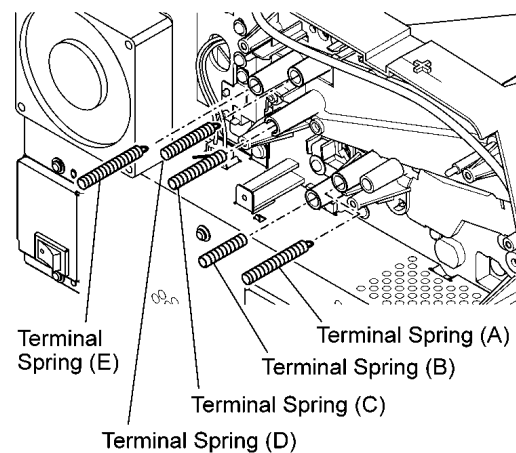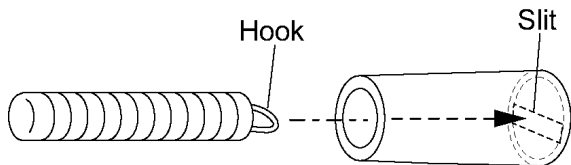
3.5.2. Power Supply Unit

(1) Disconnect the 2 connectors.

(2) Remove the 3 screws (A) and 2 screws (B).

Caution :

   The screw (A) differs from the screw (B). When reinstalling the screw, return it to the original position.

(3) Remove the Power Supply Unit.

Connector CN202

Power Supply Unit

Black Cable

Screw (A)

Screw (A)

Screw (B)

Connector CN251
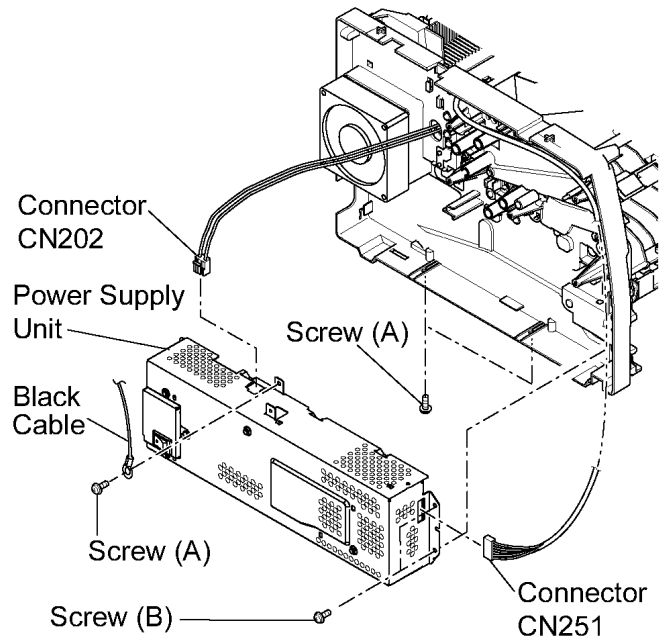
3.5.3. Power Supply Unit Disassembly

(1) Remove the Inlet Bracket with Power Lead Wire Assembly {4 screws (A)}.

Caution :

   When reinstalling the terminal of cable, it must be attached tooth side as shown to fix it certainly.

(2) Remove the Enclosure Cover {2 screws (A) and 2 screws (B)}.

Inlet Bracket

Terminal of Cable

Screw

Star Washer

Inlet Bracket

Screw (A)

Screw (A)

Power Supply Board Complete

Screw (A)

Screw (B)

Enclosure Cover
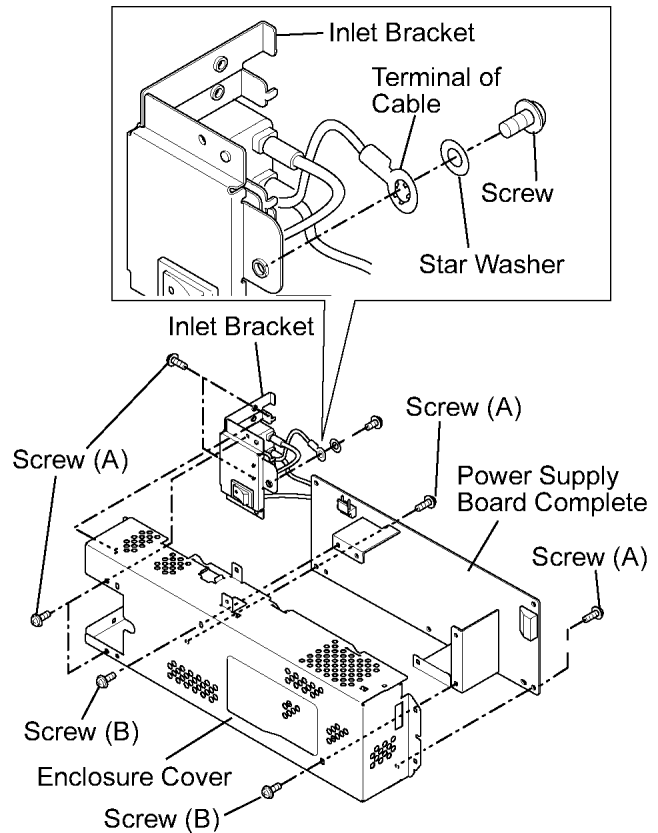
Screw (B)

3.6. Indicator Board and Toner Empty Sensor Board

Before handling, remove the Right Cover (see Section 3.2).

(1)   Disconnect the Flat Cable from the Indicator Board.

(2)   Remove the Indicator Board.

(3)   Remove the screw.

(4)   Remove the Toner Empty Sensor Board.

(5)   Disconnect the cable from the Toner Empty Sensor Board.

Cable

Screw

Toner Empty
Sensor Board

Indicator Board   Flat Cable
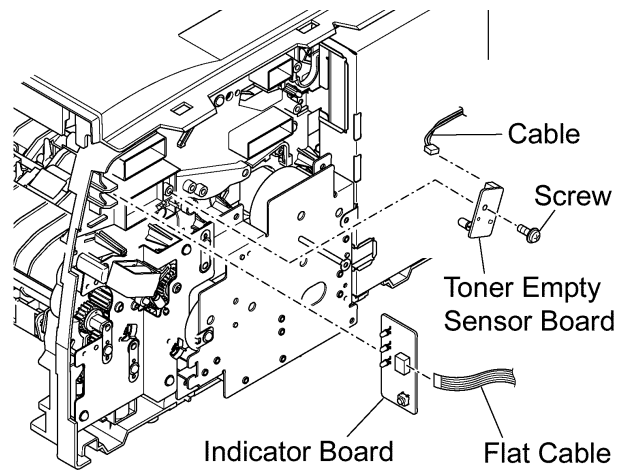
3.7. Main Controller Board and Fuser Drive Gear

Before handling, remove the Right Cover (see Section 3.2).

3.7.1. Main Controller Board

(1)   Remove the 5 screws (A) and 2 screws (B).

(2)   Remove the Main Board Shield Cover.

Screw (B)

Screw (A)

Main Board
Shield Cover
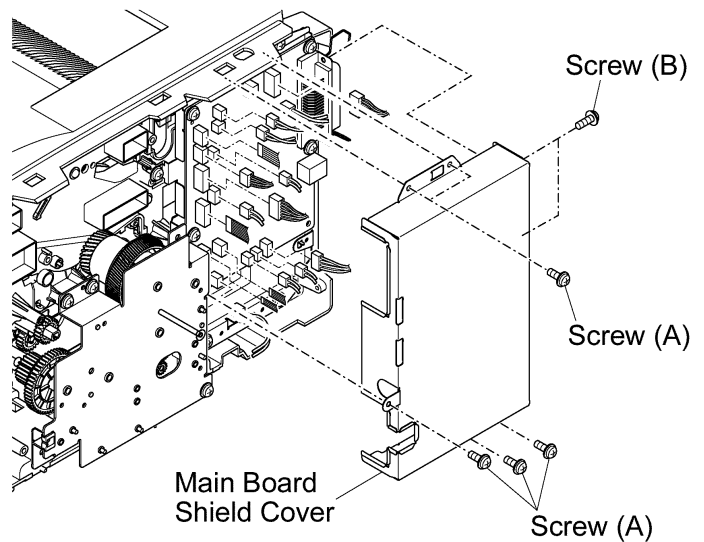
Screw (A)

(3)   Disconnect the 12 connectors and 4 Flat Cables.

(4)   Remove the Main Controller Board (4 screws).

Main Control Bord

Screw

Clamp
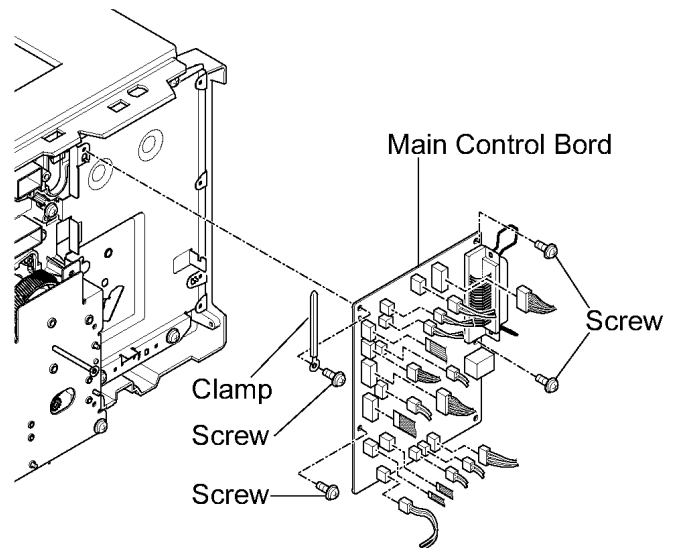
Screw

Screw

3.7.2. Fuser Drive Gear

(1) Remove screw (A) and 6 screws (B).

Caution :

Screw (A) is different from screw (B). When reinstalling the screw (A), return it to the original position.

(2) Remove the Fuser Drive Gear Bracket.

(3) Remove the Fuser Drive Gear and Intermediate Gear.

Caution:

Be careful not to lose the plastic ring behind the Fuser Drive Gear.

Fuser Drive Gear

Fuser Drive Gear Bracket

Plastic Ring

Screw (B)

Screw (A)

Intermediate Gear

Gear Tension Spring
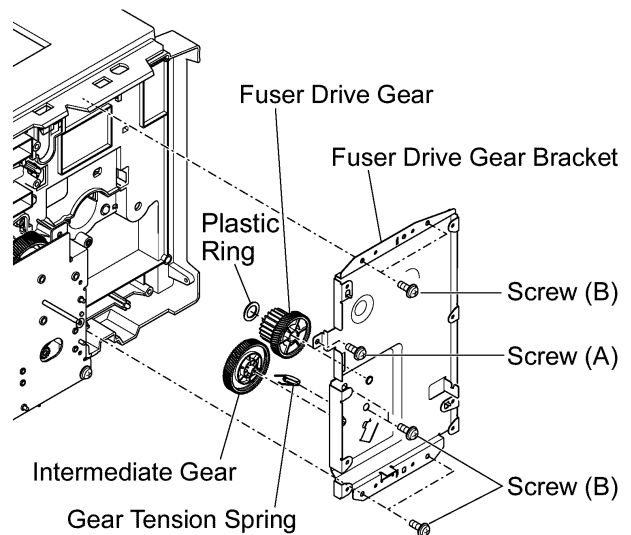
Screw (B)

3.8. Fan Motor

Before handling, perform the following steps A - B :

A. Remove the Right and Left Covers (see Section 3.2).

B. Remove the Main Board Shield Cover (see Section 3.7.1).

(1) Remove the 2 screws.

(2) Remove the Fan Motor.

(3) Disconnect connector CN 19 on the Main Controller Board.

Screw

Fan Motor

34
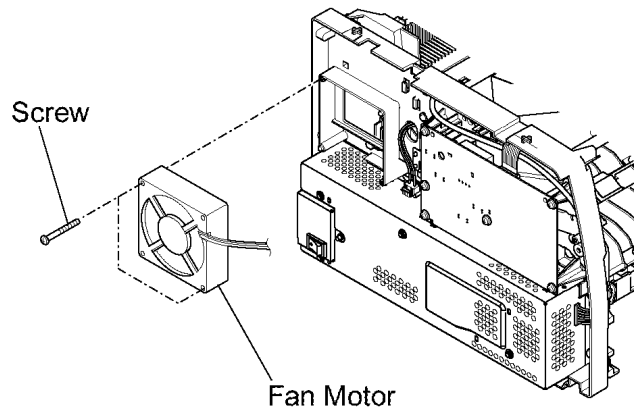
3.9. Gear Support Bracket, Motor and Drive Gear Unit

Before handling, perform the following steps A - B :

A. Remove the Right Cover (see Section 3.2).

B. Remove the Main Board Shield Cover (see Section 3.7.1).

3.9.1. Gear Support Bracket

(1) Disconnect the connector CN13 from the Main Controller Board.

(2) Remove screw (A) and 4 screws (B).
   Caution:

   Screw (A) is different from screw (B). When reinstalling the screw, return it to the original position.

(3) Remove the Gear Support Bracket and solenoid.

(4) If necessary, remove the 8 gears from the chassis.

8 Gears Location
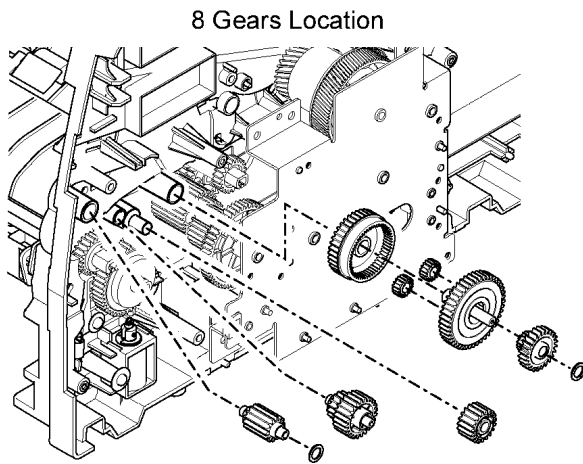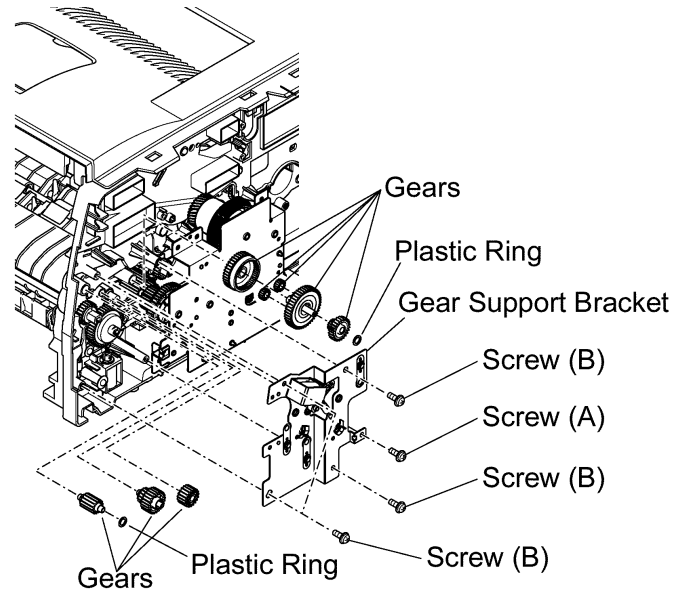
3.9.2. Drive Gear Unit and Motor

(1) Disconnect the connector CN18 from the Main Controller Board.

(2) Remove the 2 screws (A) and screw (B).

(3) Remove the Relay Board (A) and cable from the Drive Gear Unit.

(4) Remove the 5 screws (C).
   Caution:

   The screw (B) differs from the screw (C). When reinstalling the screw, return it to the original position.

(5) Remove the Drive Gear Unit.

Gears
Plastic Ring
Gear Support Bracket
Screw (B)
Screw (A)
Screw (B)
Gears
Plastic Ring
Screw (B)

Main Control Board
CN18
CN13
Screw (C)
Relay Board(A)
Screw (A)
Drive Gear Unit
Screw (C)
Screw (B)
Cable
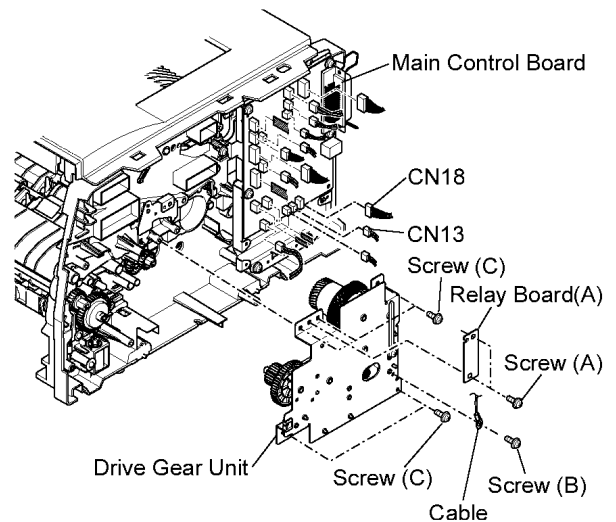
3.9.3. Drive Gear Unit Disassembly

(1)   Remove the Motor (2 screws) from the Drive Gear Unit.

(2)   Remove the 5 screws.

(3)   Remove the Motor Bracket.

(4)   All gears can be removed after removing the plastic ring.

Drive Gear Bracket

Plastic Ring

Plastic Ring

5 Screws

Motor Bracket

Motor
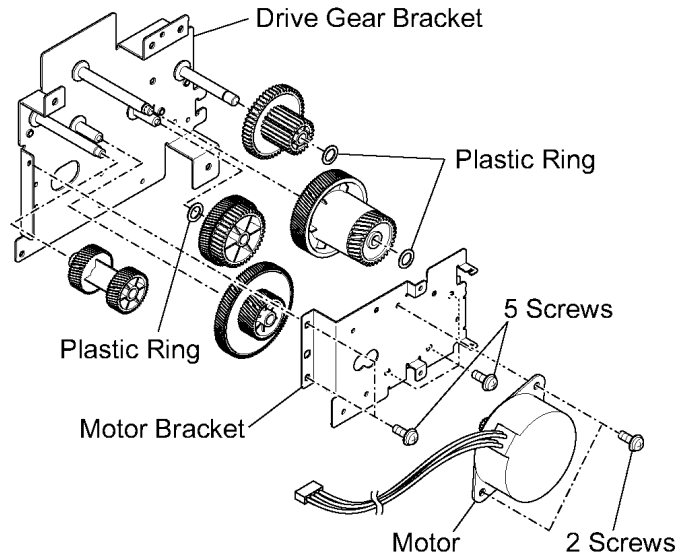
2 Screws

3.10. Upper Exit Roller Holder

Before handling, perform the following steps A - B :

A. Remove the Right, Left and Top Covers (see Section 3.2).

B. Remove the Main Board Shield Cover (see Section 3.7.1).

3.10.1. Upper Exit Roller Holder

(1) Remove the 4 screws.

(2) Separate the Upper Exit Roller Holder.

(3) Disconnect connector CN14 on the Main Controller Board.

Connector CN14

Screw

Upper Exit Roller Holder
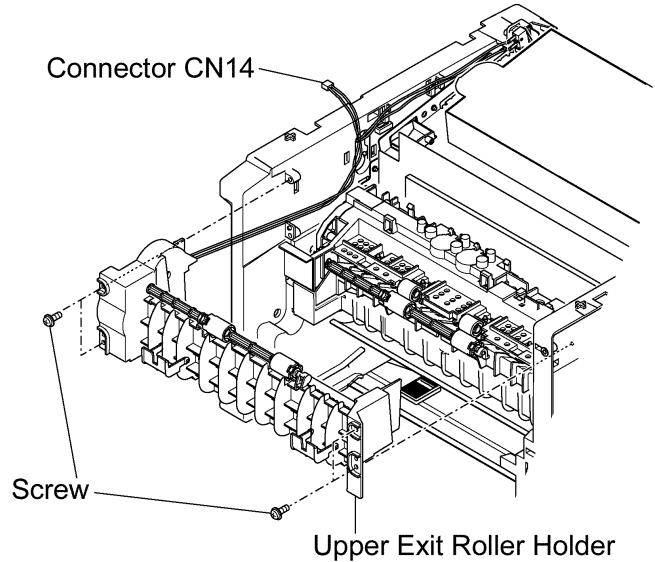
3.10.1.1. Upper Exit Roller Holder Disassembly

1. Remove the 2 screws.
2. Separate the Holder Cover with solenoid from the Upper Exit Roller Holder.
3. Remove the gears from the roller holder.

Holder Cover

Screw

(color: white)

Solenoid

(color: black)

Upper Exit Roller Holder
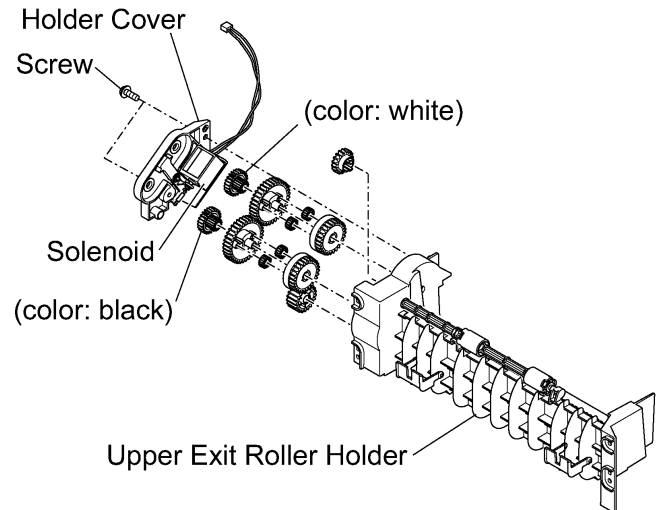
3.11. Fuser Unit

Before performing the following steps, remove the upper Exit Roller Holder (see Section 3.10).

(1) Disconnect connector CN9 on the Main Controller Board.

(2) Disconnect the connector CN202 from the Power Supply Unit.

(3) Disconnect the connector CN407 from the Relay Board (B).

(4) Remove the 4 screws.

(5) Remove the Fuser Unit.
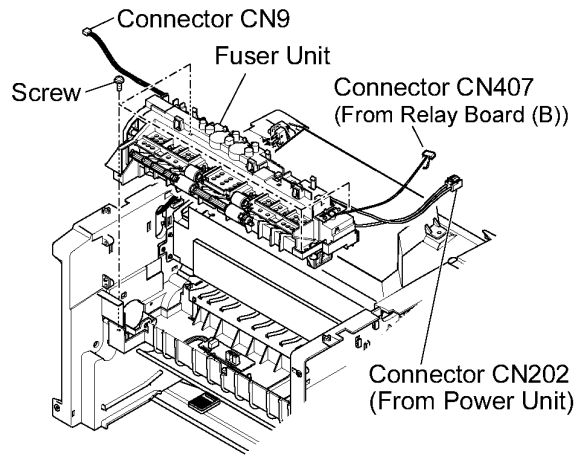
3.11.1. Fuser Unit Disassembly

(1) Remove the Lower Exit Roller Gear.

(2) Remove the 2 black screws.

(3) Separate the Heat Roller Holder from the Fuser Unit Base.

(4) Remove the Pressure Roller, 2 bushings, 2 springs and Lower Exit Roller from the Heat Roller Holder.

(5) If necessary, remove the Pinch Rollers and Cleaning Rollers.

Caution:

· **When reinstalling the Pinch Roller and Spring, the spring hook is attached upward to prevent any damage to the printing media as shown following figure.**
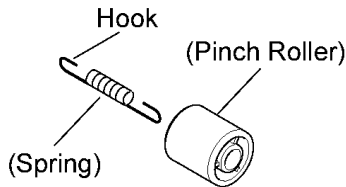
· **When reinstalling the Cleaning Roller and Spring, the spring hook is attached downward and the cut edge of the cleaning roller is located as shown following figure to prevent any damage to the Pressure Roller.**

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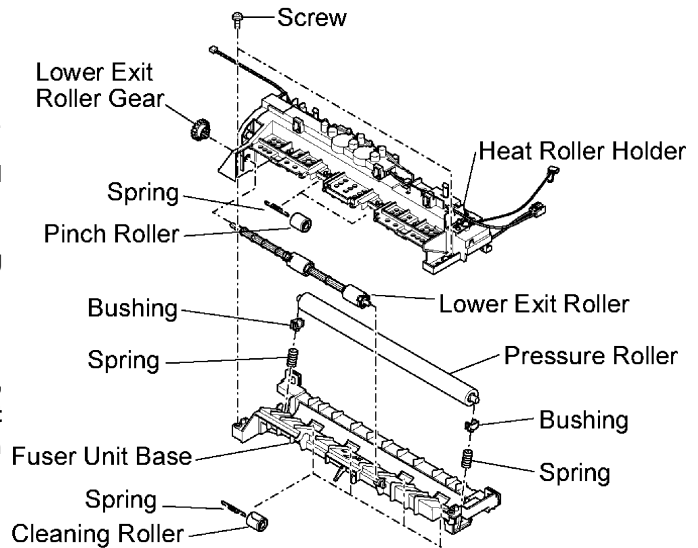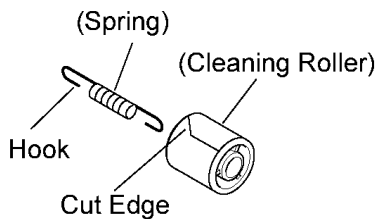
Note:

When reinstalling the exit roller rubber to the lower exit roller shaft, ensure it is installed as shown in figure-(A).

Figure - (A)

Lower Exit Roller Shaft

Exit Roller Rubber (black)
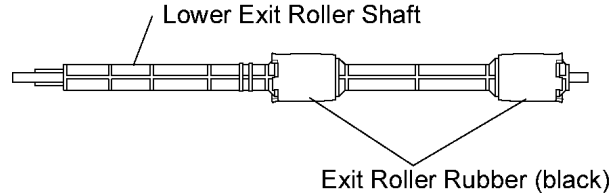
3.11.2. Heat Lamp

(1) Remove the Side Fuser Cover (2 screws).

(2) Remove the screw (A) and screw (B) from the ends of Heat Lamp Terminals.

(3) Slide out the Heat Lamp.
   Caution:

   · **Do not touch the heat lamp with your fingers.**

   a. It may be hot.

   b. The oil and dirt from your fingers will contaminate the surface, which will result in damaging the heat lamp when it is turned on.

   · **When reinstalling the heat lamp, set the terminal of the heat lamp in the center of the Heat Roller to prevent from shorting, or shock, fire or other hazards may occur. {see figure (A)}**

   · **When reinstalling the Heat Lamp, the terminal cable must be attached at the rivet side as shown to fix them certainly. {see figure (B)}**

Slide Out

Terminal of Heat Lamp

Heat Lamp

Star Washer

Screw (A)

Heat Roller

Figure (A)

Slide Out

Heat Lamp

Terminal Cable

Screw (B)

Figure (B)
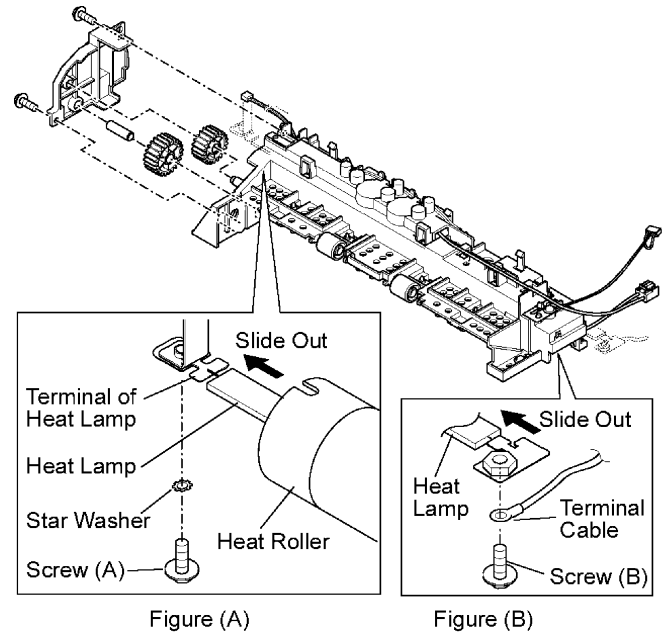
3.11.3. Heat Roller

(1) Remove the screw and Thermistor.

(2) Remove the Heat Roller Gear and Bushing.

(3) Remove the Heat Roller with care to prevent scratching or damage to the surface of the Heat Roller.

Heat Roller Gear

Bushing

Thermistor

Screw

Heat Roller

Bushing
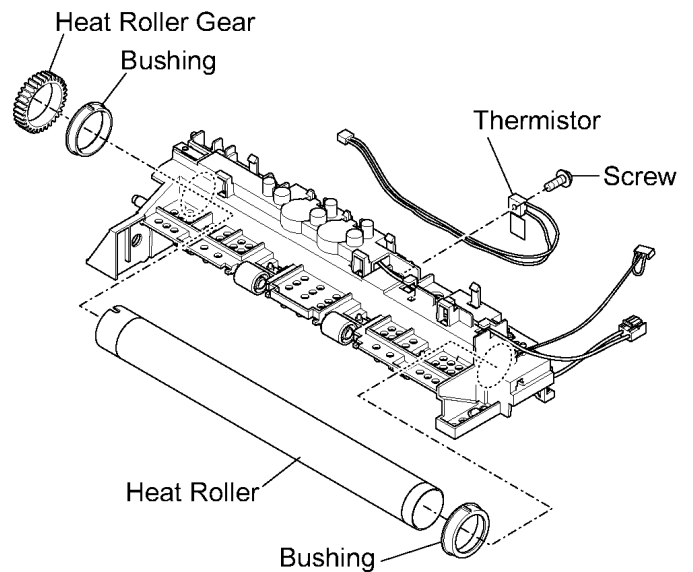
3.11.4. Thermostat

(1)   Remove the 2 screw (A) and Thermal Fuse.

(2)   Remove the screw (B) and Thermostat.

Screw (A) —— —— Screw (B)
Thermal Fuse ——

Thermostat

(Bottom Side View)
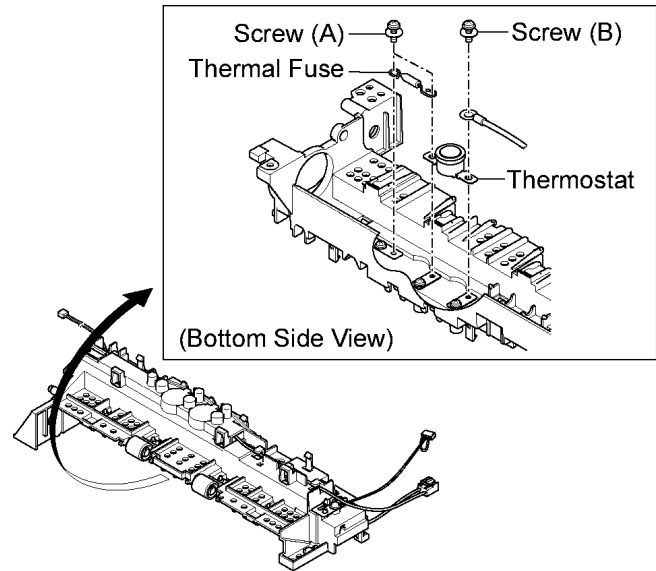
Caution :

· **When reinstalling the thermostat, both end terminals must be positioned under the terminals of thermal fuse and lead wire as shown in the following figure, or thermostat cannot properly measure the surface temperature of the heat roller becausethe distance between the surface of heat roller and thermostat may change.**

· **When reinstalling the thermal fuse and thermostat, the screws must be tightened in order (1), (2), (3) to position them correctly as shown in the following figure.**

(1)

Screw (A) —— —— Screw (B)

(3)   (2)

Thermal Fuse ——

Attach at the rivet side as shown.

Thermostat

40
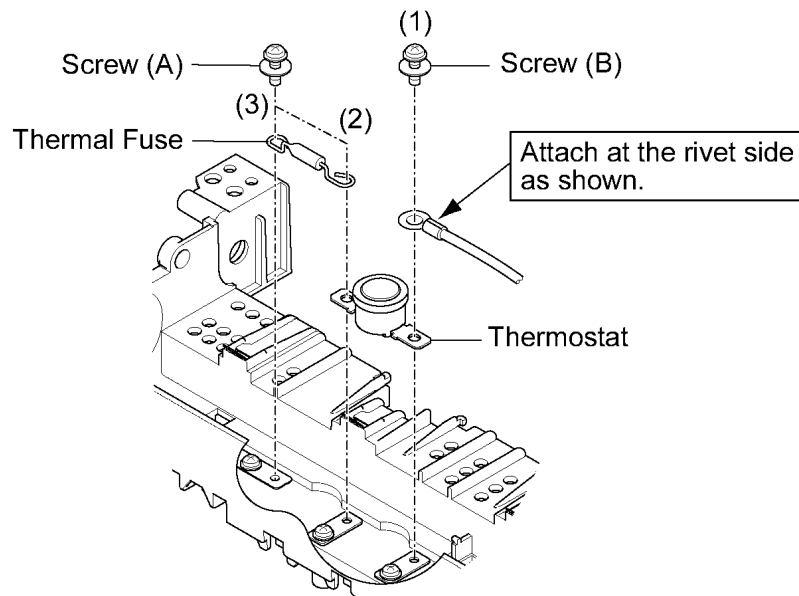
3.11.5. Paper Exit / ADU Paper Jam Sensor Lever and Paper Exit / ADU Paper Jam Sensor Board

1. Remove the Fuser Unit (see section 3.11).

2. Remove the Paper Exit/ADU Paper Jam Sensor Lever with spring.

3. Disconnect the flat cable.

4. Remove the Paper/ADU Paper Jam Sensor Board by releasing the hooks.

Fuser Unit

Spring

Paper Exit/ADU Paper Jam Sensor Lever

Flat Cable   Paper/ADU Paper Jam Sensor Board

Hook

Hook
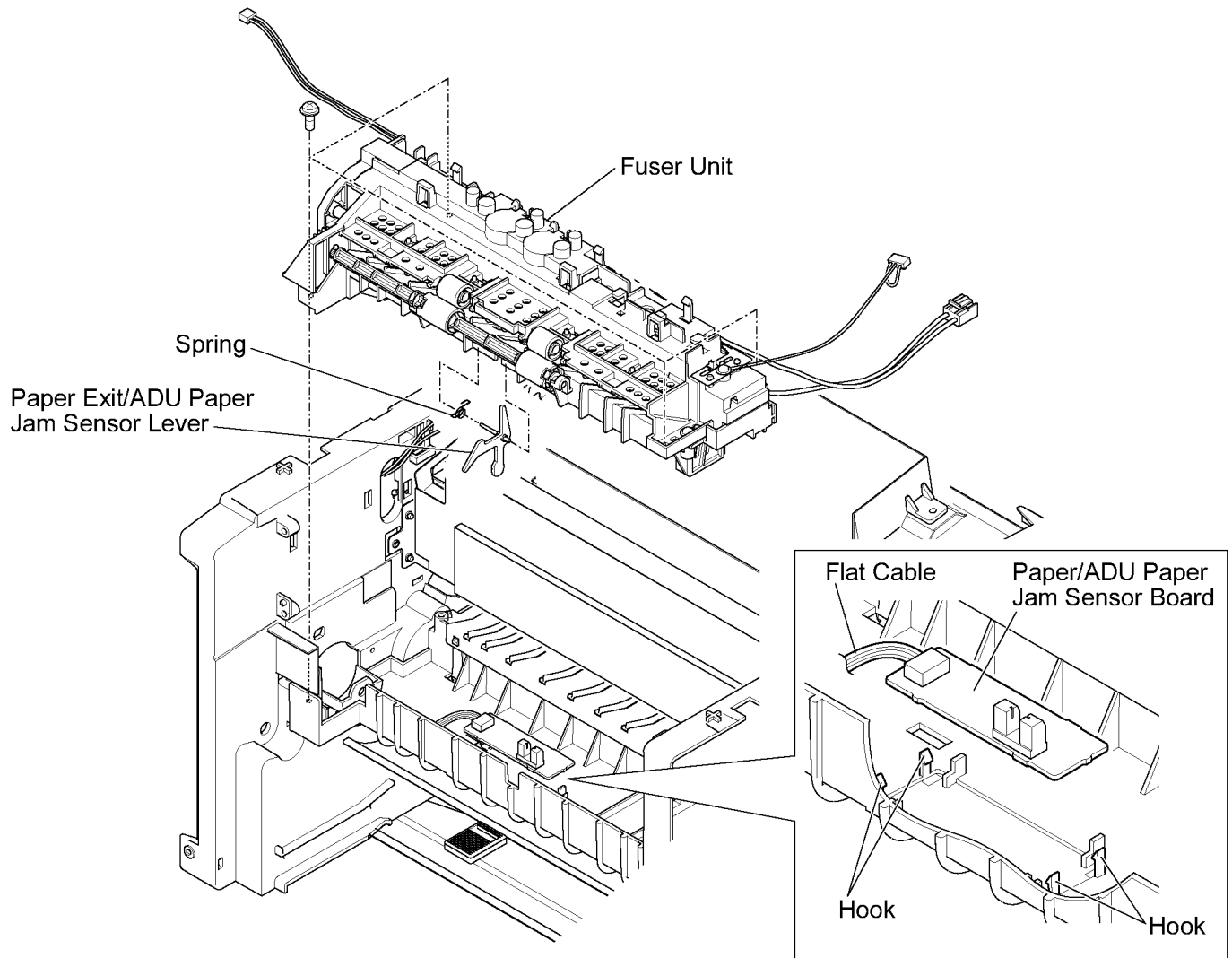
3.12. Pickup, Paper Feed, Registration and Transfer Rollers

Before handling, perform the following steps A - B :

A. Remove the Gear Support Bracket and 8 gears (see Section 3.9.1).

B. Remove the Front Cover (see Section 3.1.1).

3.12.1. Pickup Roller and Pickup Solenoid

1. Release the bushing hook and slide out the bushing.

2. Slide the Pickup Roller Shaft with gears in the arrow direction, then remove the Pickup Roller.

3. If necessary, remove the Pickup Roller Gears and bushing by releasing the gear hook from the Pickup Roller Shaft. Then, remove the Pickup Roller Shaft.

4. Disconnect the connector CN12 from the Main Controller Board.

5. The Pickup Roller Lever and Pickup Solenoid and spring can be removed from the chassis frame by removing the 2 screws.
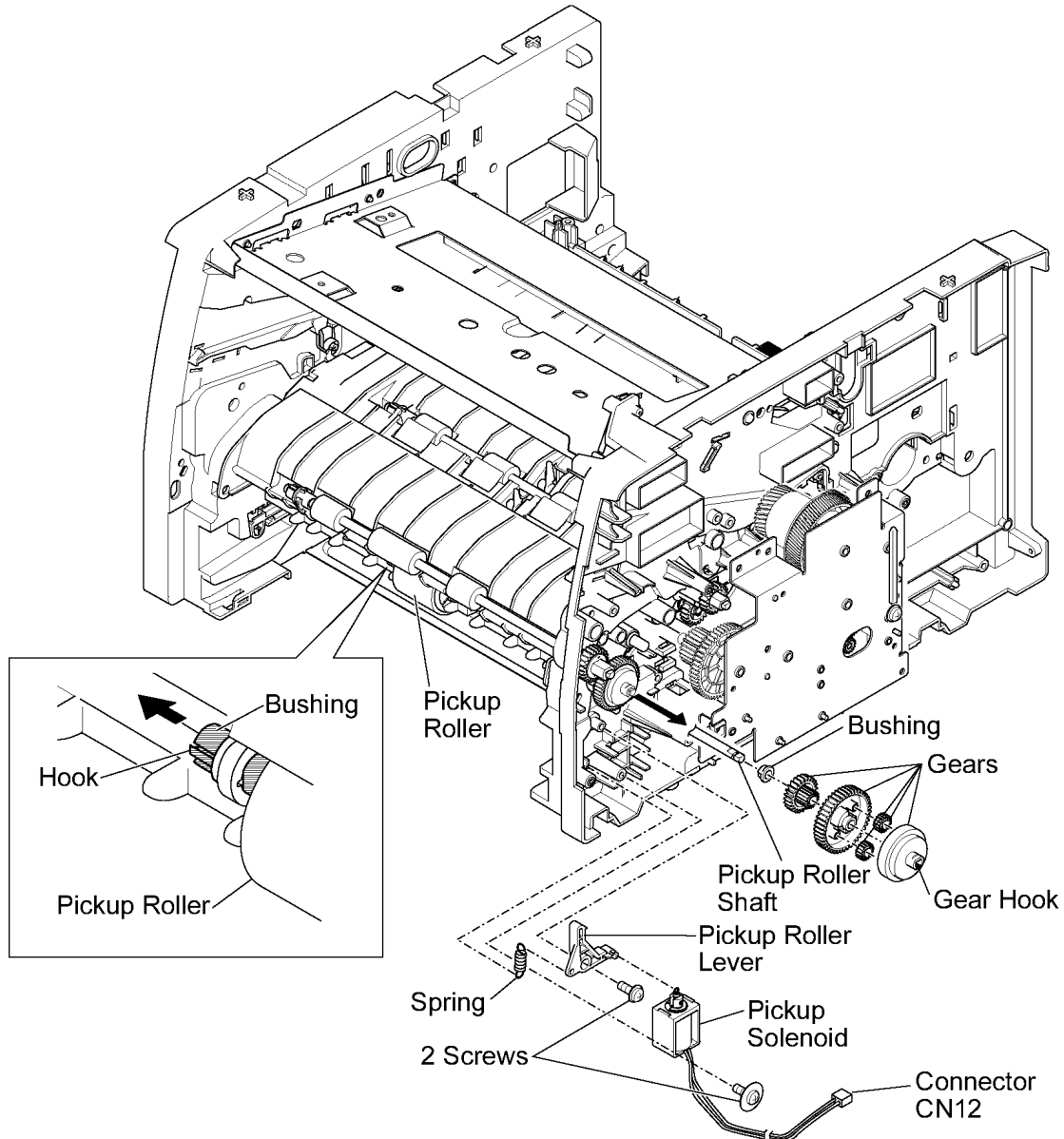
3.12.2. Paper Feed Roller / Registration Roller

3.12.2.1. Paper Feed Roller

1. Slide out the bushing from the Paper Feed Roller Shaft.

2. Remove the Paper Feed Roller Gear and Drive Wheel by releasing the hook from the Paper Feed Roller Shaft. Then, remove the Paper Feed Roller Shaft.

3.12.2.2. Registration Roller

1. Slide out the bushing from the Registration Roller Shaft.

2. Remove the Registration Roller Gear by releasing the gear hook from the Registration Roller Shaft. Then, remove the Registration Roller Shaft.
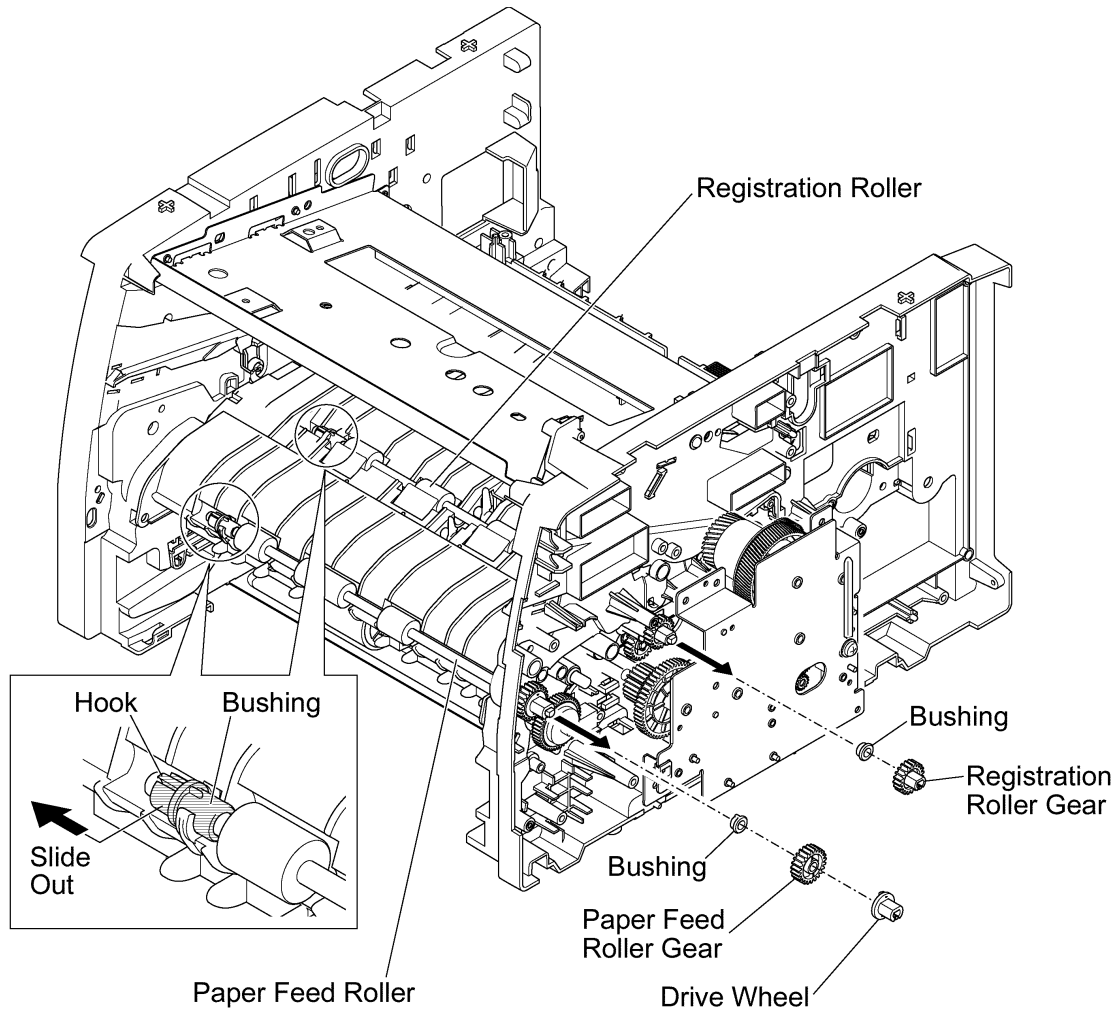
3.13. Transfer Roller Assembly

Before handling, perform the following step.

A. Remove the Front Cover (see Section 3.1.1).

1. Remove the 2 Transfer Roller Holders.

2. Remove the Transfer Roller Assembly by pulling up it.

Caution:

      · Do not touch the surface of Transfer Roller to prevent any print quality problems.

Transfer Roller Assembly

Transfer Roller Holder
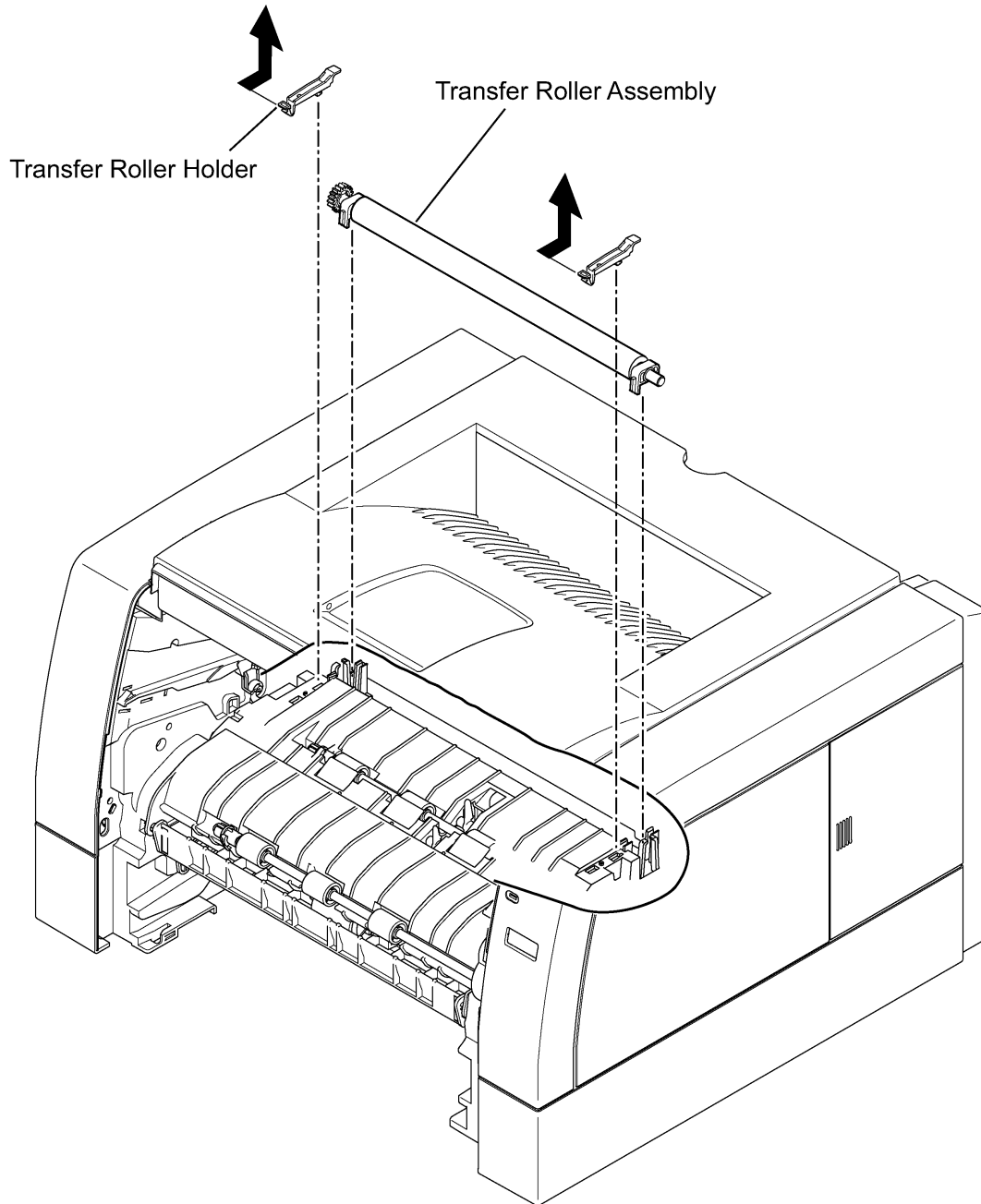
3.14. Auto Duplex Unit, ADU Registration Roller and ADU Pinch Roller

Before handling, perform the following steps A-B :

A. Remove the Paper Cassette and OPC Drum Unit.

B. Place the printer up side down.

3.14.1. Auto Duplex Unit (ADU)

(1) Remove the 2 screws (A) and 4 screws (B).

Caution:

Screw (A) is different from screws (B). When reinstalling the screw (A), return it to the original positon.

(2) Remove the Bottom Stay.

(3) Remove the Auto Duplex Unit with care to prevent damage to the A/D Unit Joint Gear {4 screws and screws (C)}.
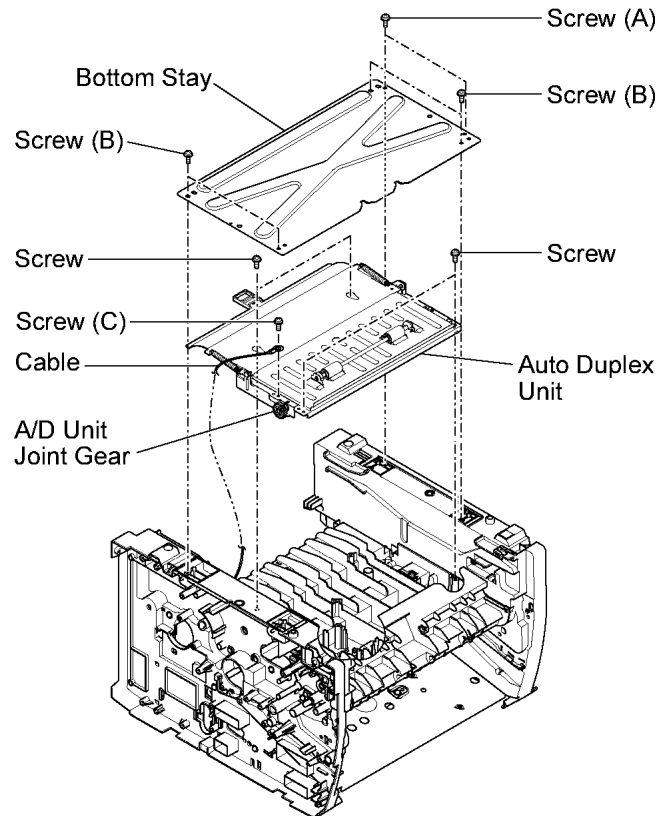
3.14.1.1. Auto Duplex Pinch and Registration Rollers

1. Remove the 3 plastic rings and 2 springs.

2. Remove the A/D Roller Shaft and 2 Auto Duplex Pinch Rollers.

3. Remove the E-ring.

4. Remove the A/D Unit Joint Gear from the ADU Registration Roller Shaft. The Registration Roller Shaft and 2 bushings can be remove from the Auto Duplex Unit frame.

Note:

When reinstalling the A/D Rollers Shaft to ADU Pinch Roller Plate, ensure that it is installed as shown in Fig. (A).

Fig. (A)

45
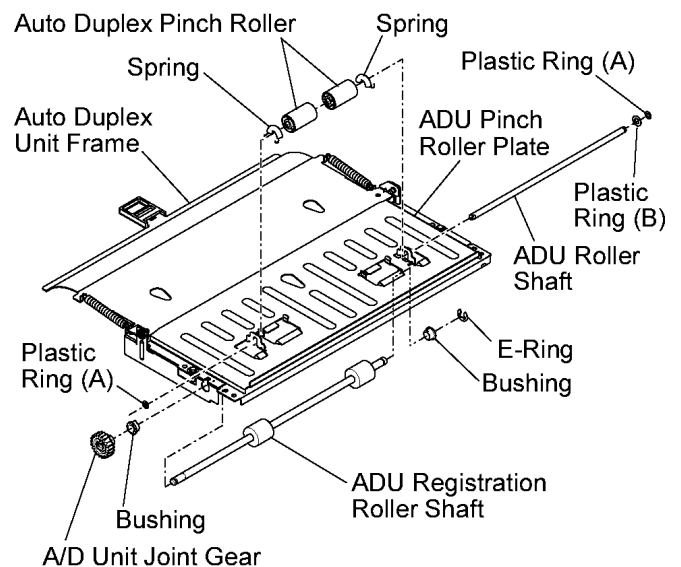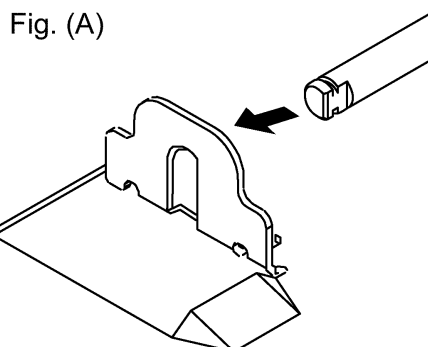
3.14.1.2. Auto Duplex Disassembly

1. The ADU Pinch Roller Plate can be separated from the Registration Roller Plate by removing the screw (A).

2. The ADU Jam Release Pan can be separated from the Registration Roller Plate by removing the 2 screws (B) and 2 springs.

Screw (A)

ADU Pinch
Roller Plate

Spring

Jam Release Pan

Screw (B)

Spring

Screw (B)

ADU Registration
Roller Plate

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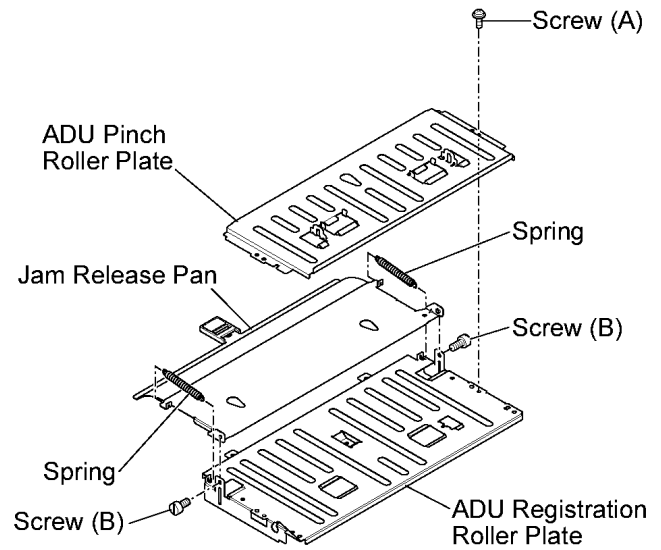
3.15. Registration Sensor, Paper Top Detection Sensor and Registration & Paper Top Detection Sensor Board

Before handling, perform the following steps A - D :

A. Remove the Paper Cassette and OPC Drum Unit.

B. Remove the Left and Right Covers (see Sections 3.2.1 and 3.2.2).

C. Place the printer upside down.

D. Remove the Auto Duplex Unit (see Section 3.14).

1. Remove the screw, and disconnect the flat cable.
2. Remove the Registration & Paper Top Detection Sensor Board.
3. Remove the Registration Sensor Lever by releasing the lever axis from the projection.
4. Remove the Paper Top Detection Sensor Lever by releasing the lever axis from the chassis.
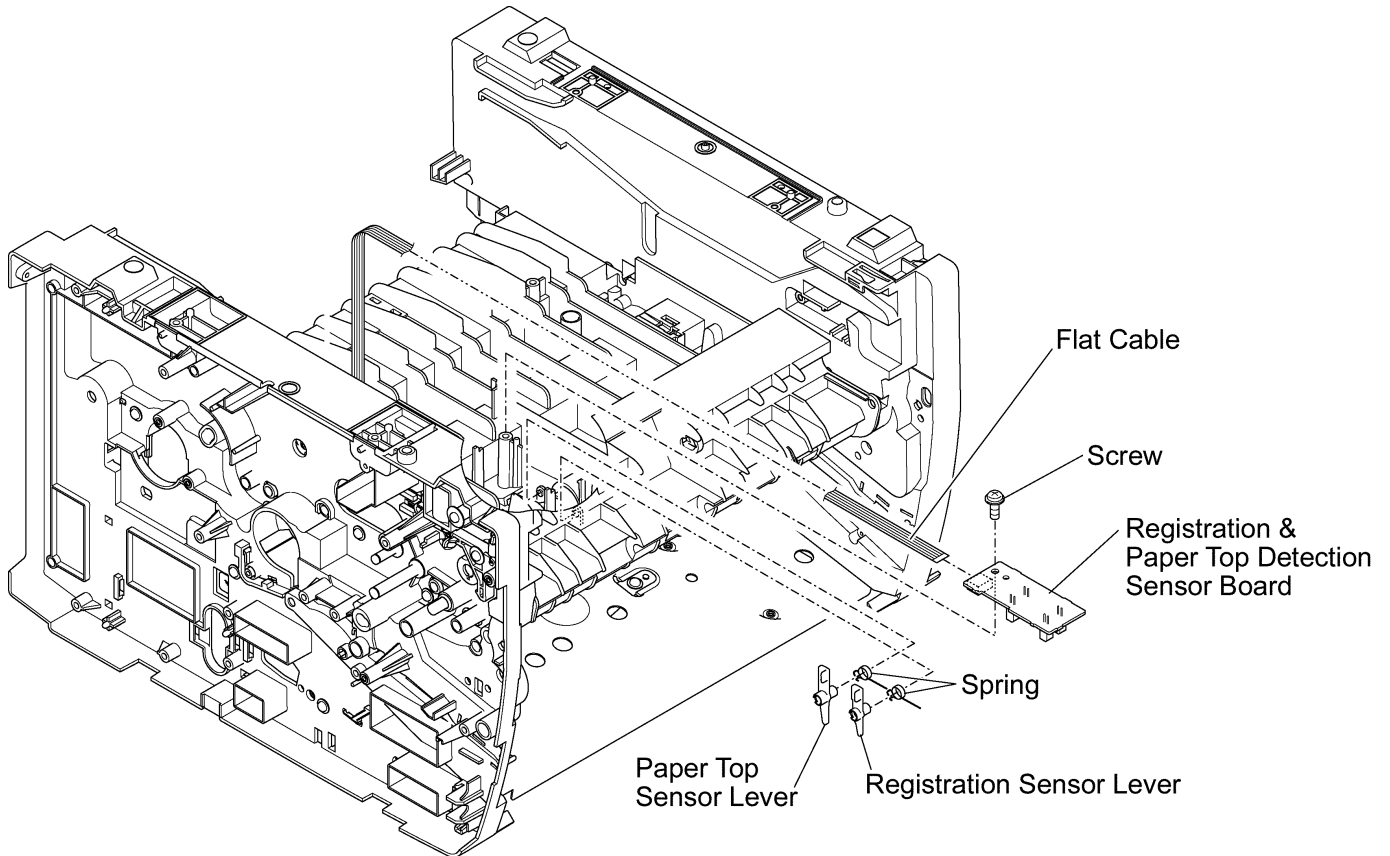
Caution :

> When reinstalling the Registration Sensor Lever, Paper Top Detection Sensor Lever and Registration & Paper Top Sensor Board, the Registration Sensor and Paper Top Detection Sensor Levers must be positioned as shown in the followingfigure (A).

KX-P7100

Figure A
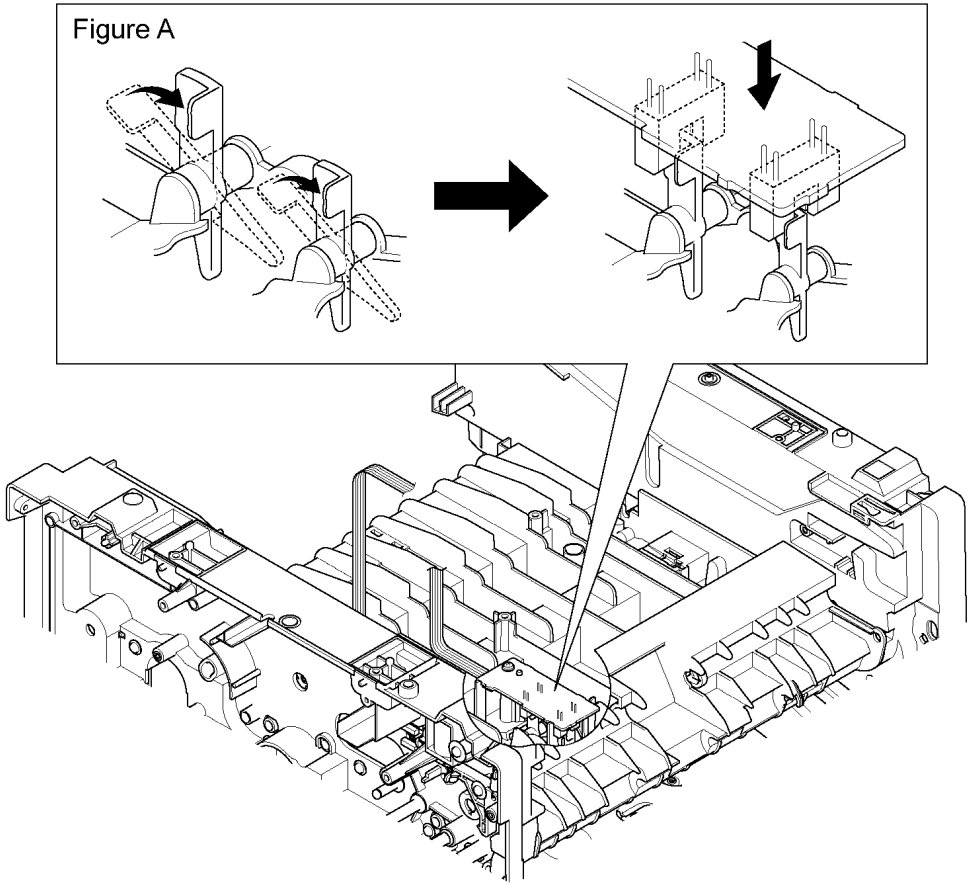
4 Electronic Circuit Description and Diagrams

4.1. Block Diagram
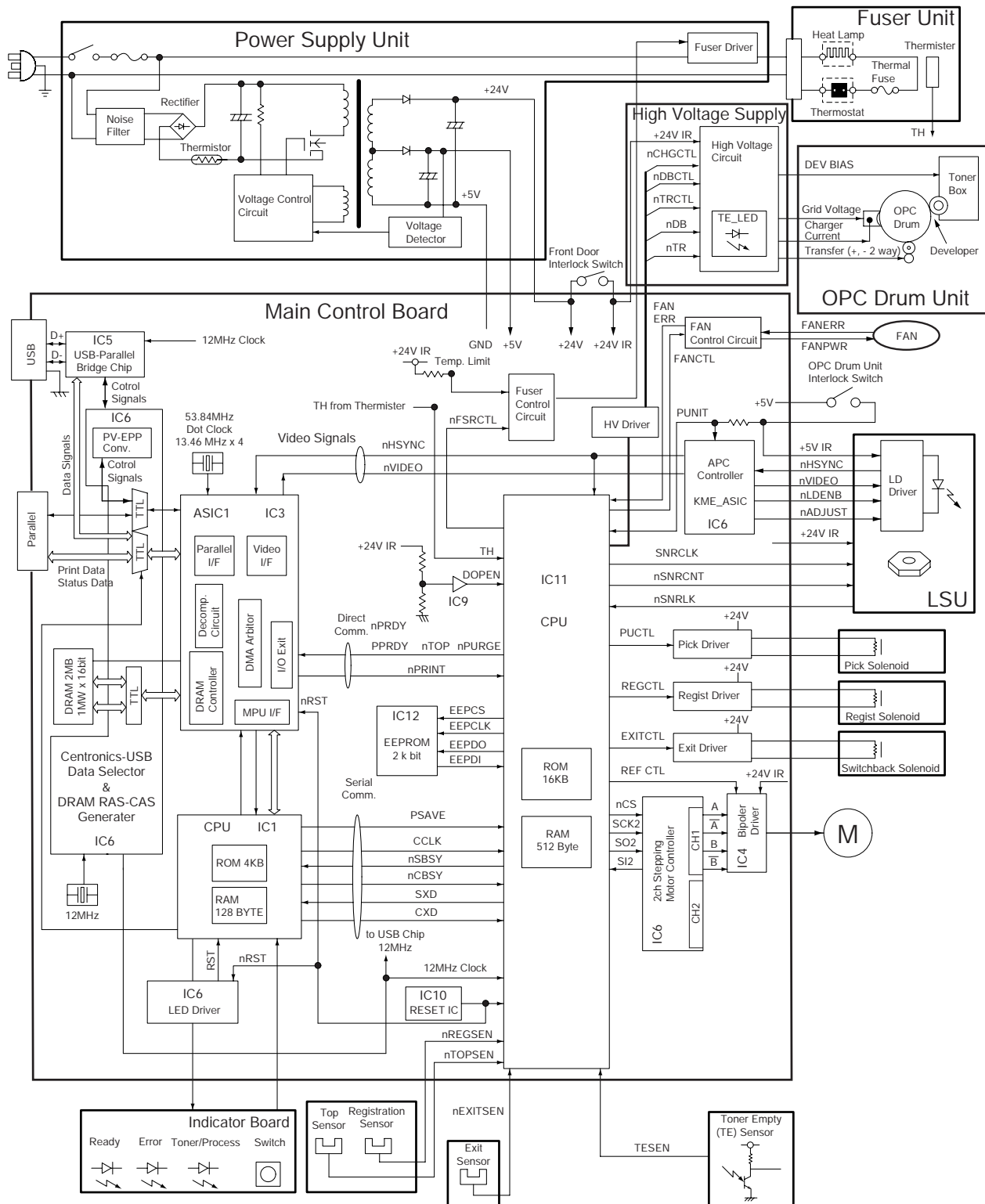
4.2. Connection Diagram

Connection Diagram
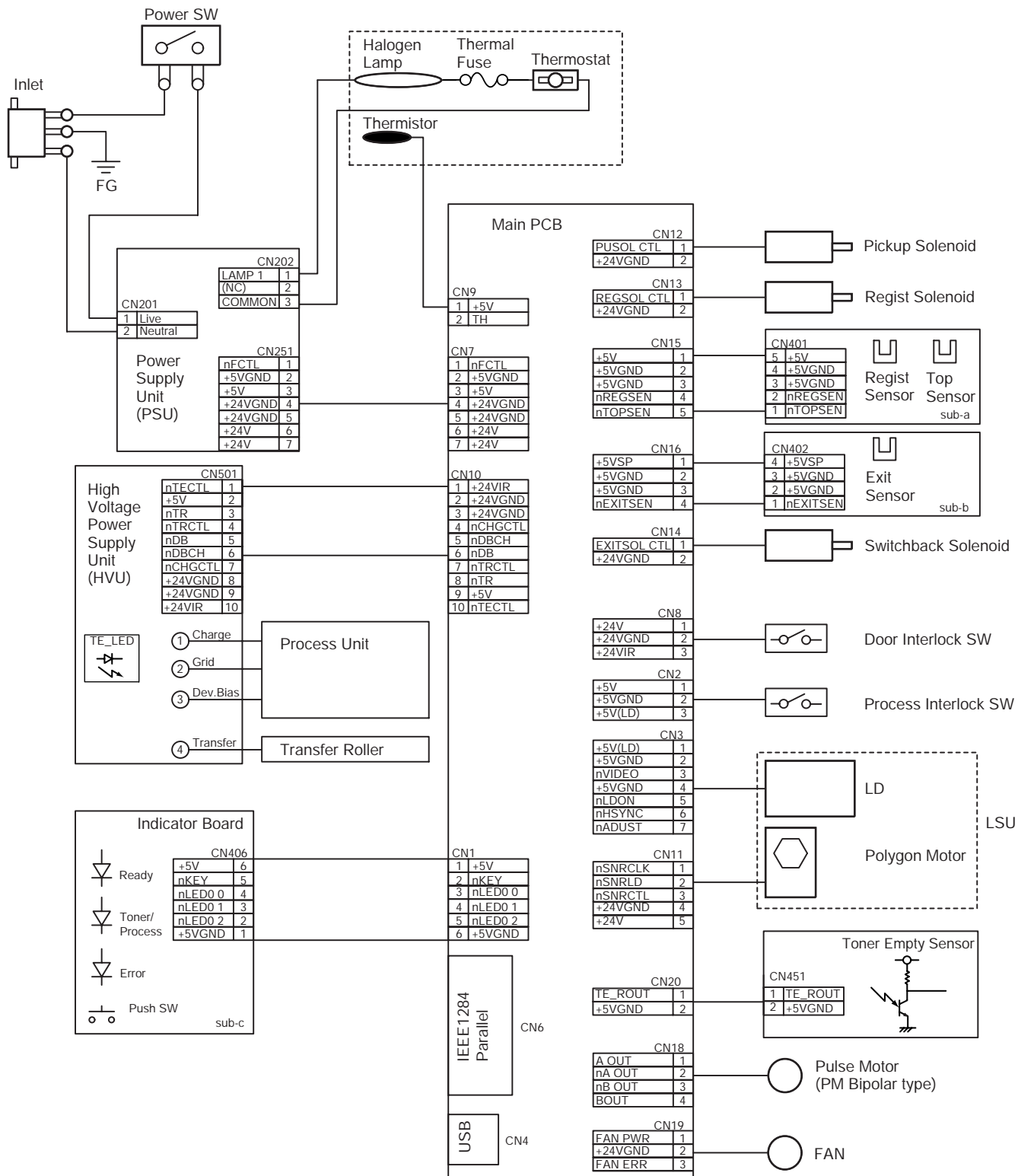
Model No.KX-P7100

4.3. Power Supply

The power supply circuit generates +5Vdc and +24Vdc. It also supplies AC Voltage to the halogen heat lamp in the fuser unit.

Power Supply Unit
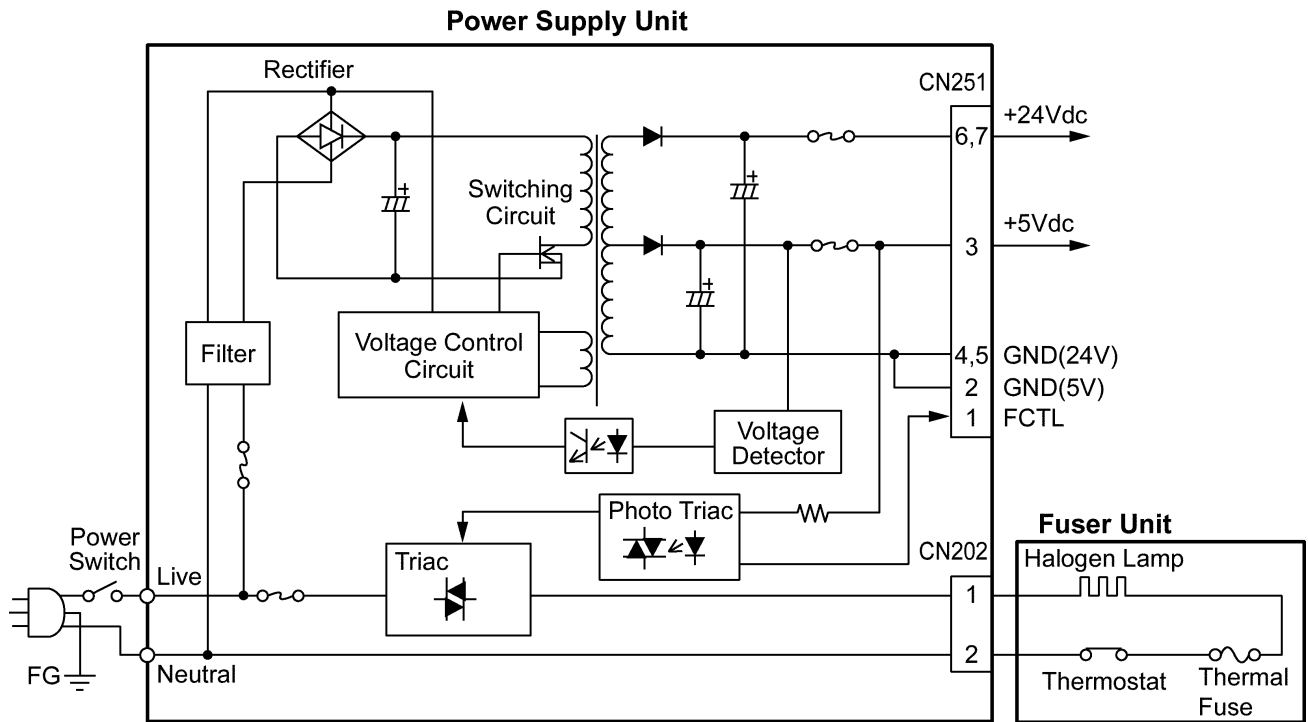
4.4. Main Control Board

4.4.1. Main Control CPU

This CPU is an 8-bit microcontroller which is compatible with the Intel 80C51.

It contains the two types of memory: ROM : 4k bytes, RAM : 128 bytes

IC1

```
                                      GDI ASIC I/F

System Clock ──→ XTAL1        AD0-7 ←──→ Address, Data Bus ⎤
        N.C. ──→ XTAL2        A8-15  ──→ Address Bus       |
System Reset ──→ RST          ALE    ──→ Address Latch      ├ GDI ASIC I/F
                                         Enable            |
                Pheripheral I/F  nWR  ──→ Write            |
                                 nRD  ──→ Read             ⎦

USB/Parallel Select 1284SEL ←── P10
                  ┌ nRDYLED  ←── P13
                  │ nERRLED  ←── RXD
Front Panel I/F   │ nDRMLED  ←── TXD       ROM 4kb
                  └ nKEY     ──→ T1
                  ┌ PSAVE    ←── P11
Engine I/F        └ nPURGE   ──→ P14
                  ┌ nINTR    ──→ INT0      RAM 128b
Interrupt         └ nCAUTOFD ──→ INT1
```
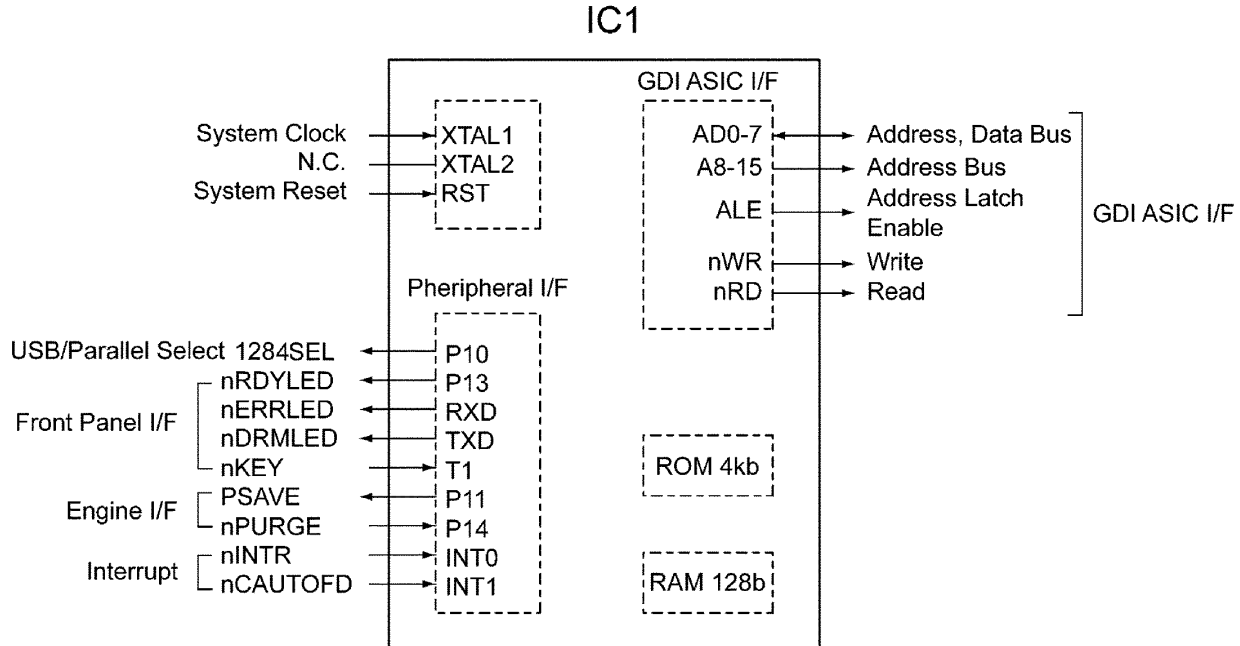
The CPU controls the RIP block of this printer. The main functions are as follows :

        1) Initialization and control of GDI ASIC

        2) Control the interface (USB/Parallel) port

        3) Windows PnP (Plug & Play) detection in Parallel

        4) LED Control and Key Detection on the front panel

The CPU processes the print data from the host PC through the GDI ASIC (IC3).

Peripheral I/F

        a) USB/Parallel Select

            1284SEL   to IC6 (ASIC)

                               H : Parallel I/F port, L : USB I/F port

        b) Front Panel I/F

            nRDYLED   sent to IC6 for driving READY LED on the front panel

            nERRLED   sent to IC6 for driving ERROR LED on the front panel

            nDRMLED   sent to IC6 for driving Process Unit LED on the front panel

            nKEY   front panel key signal for detecting the Key on the front panel

        c) Interrupt

            nINTR   interrupt signal from IC3 (ASIC)

            nCAUTOFD   signal from host PC in case of Windows' PnP request

4.4.2. GDI ASIC (IC3)

IC3

System Clock	CLKI	PIOD0-7
N.C.	CLKO	nSTROBE
	VCLK	nACK
System Reset	nRST	BUSY
		PEND
		SLCT
		nFAULT
Address/Data Bus	AD0-7	nAUTOFD
Address Bus	CA8-10	SLCTIN
Address Strobe	ASTB	nINIT

CPU I/F
- Address/Data Bus — AD0-7
- Address Bus — CA8-10
- Address Strobe — ASTB
- Write — nWR
- Read — nRD
- Interrupt — nINTR

KME ASIC I/F
- PIOD0-7
- nSTROBE
- nACK
- BUSY
- PEND
- SLCT
- nFAULT
- nAUTOFD
- SLCTIN
- nINIT

DRAM I/F
- Memory Data — MD0-8
- Memory Address — MA0-9
- Bank 0 Chip Select — nRAS0A
- Row Address Strobe — nRAS1
- Column Address Strobe — nCAS
- Memory Output Enable — nMOE
- Memory Write Enable — nMWE

Engine I/F
- nSTS — Status Data
- nSBSY — Status Busy
- GIO5 — Printer Ready
- GIO4 — Printer Power Ready
- GIO3 — Print
- nCMD — Command Data
- nCCLK — Communication Clock
- nCBSY — Command Busy
- nVSROZ — TOP
- nHSYNC — Hsync
- VDO0 — Video Data

1) CPU Interface

The CPU interface consists of an 8-bit data bus and control signals between GDI ASIC and CPU.

2) DRAM I/F

This block controls DRAM, which is the buffer where transient print data is stored.

3) KME ASIC I/F

This block is the interface with the KME ASIC (IC6).

It receives the compressed print data through KME ASIC via Parallel I/F or USB I/F from host PC.

It decompresses the received print data, converts it into actual bit map data, and sends it to the engine as video data through the Engine Interface. At this time, DRAM is transiently used as a buffer.

4) Engine I/F

Refer to 4.4.17.

4.4.3. USB Chip

This USB Chip is a customized USB-Parallel Convertor.

The Parallel side of this USB chip is suitable for the GDI ASIC via KME ASIC.

IC8

```
System Clock ──────►│X1 │        │ 0-7 │◄────►
        N.C. ───────│X2 │        │nSTROBE│─────►
System Reset ──────►│RST│        │ nACK │◄─────
                                 │ BUSY │◄─────
                                 │ PEND │◄─────     KME ASIC
USB Differential + ◄──►│D+ │     │ SLCT │◄─────     I/F
USB I/F  USB Differential - ◄──►│D- │  │nFAULT│◄─────
      +3.3V ◄──────│VCP│        │nAUTOFD│─────►
                                 │SLCTIN│─────►
                                 │ nINIT │─────►
```
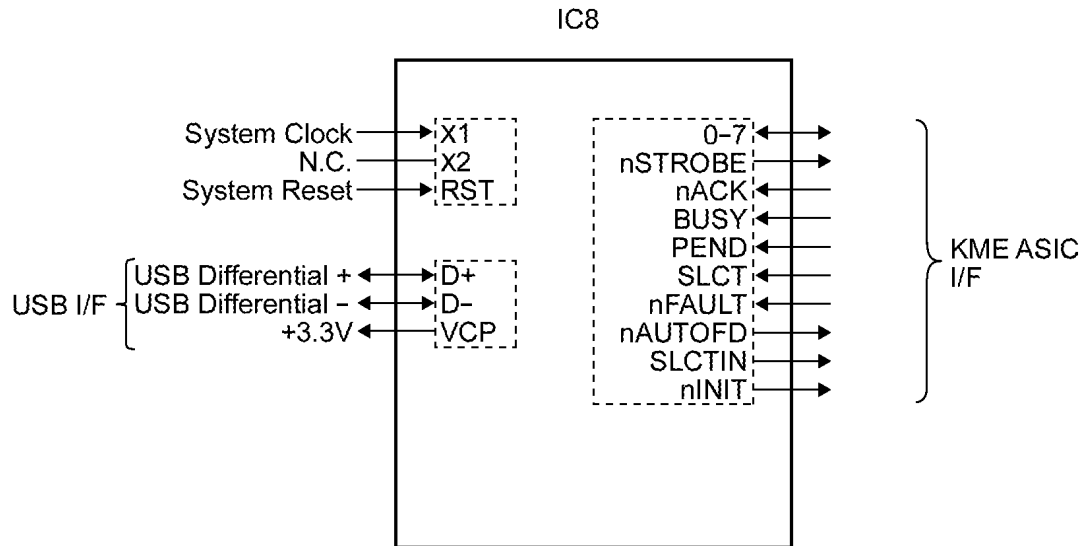
4.4.4. DRAM

A 2MByte EDO DRAM, which is organized as 1,048,576 words x 16 bits, is mounted on this Main board.

DRAM is used as the transient buffer for print data from the host PC to Engine.

4.4.5. ASIC (KME)

IC6 (ASIC)
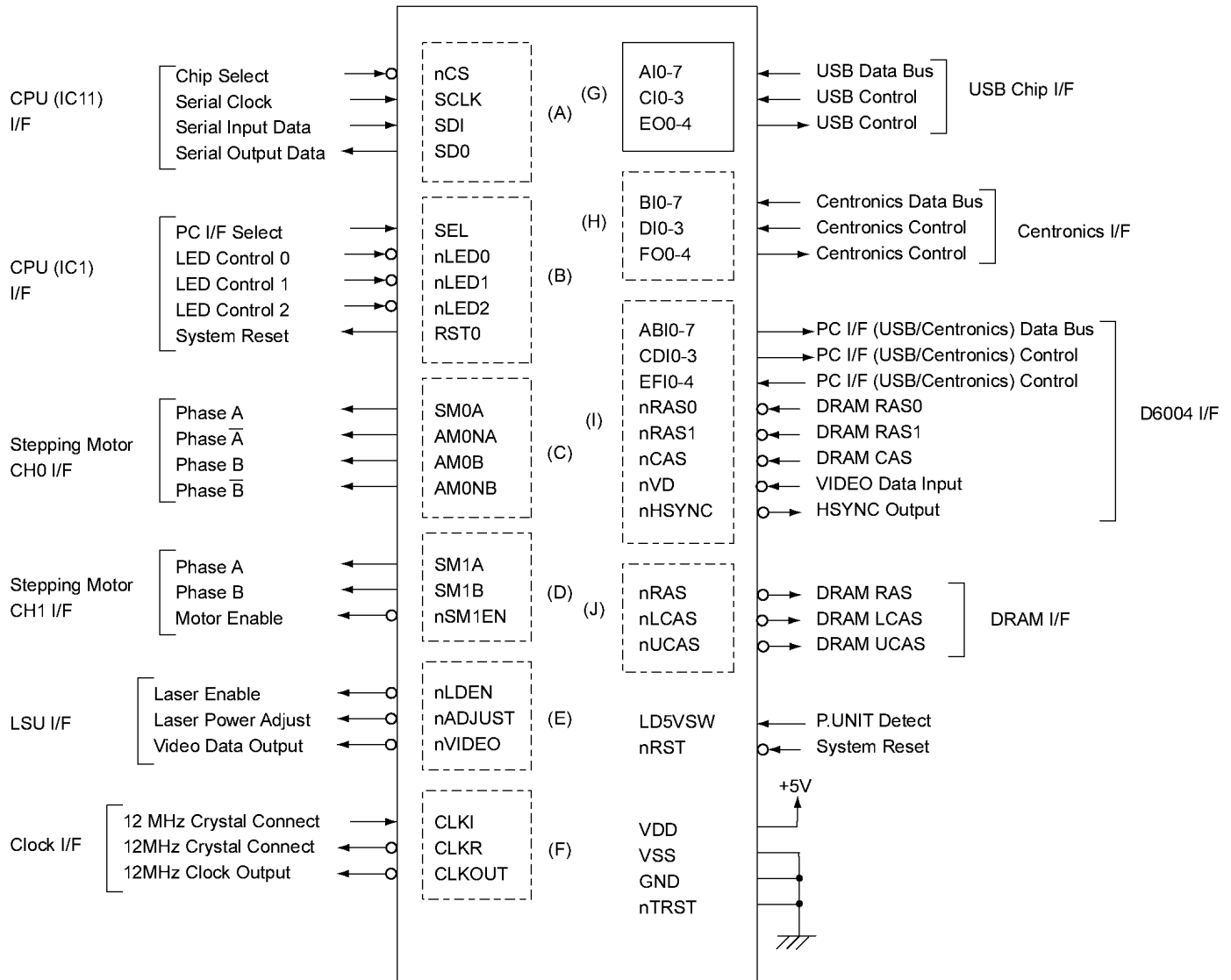
(A) This block is the serial communication interface with the Engine CPU (IC11).

(B) This block is the interface with the GDI Controller CPU (IC1).

(C) This block is the Stepping Motor Controller (CH0) to control the main motor.

(D) This block is another Stepping Motor Controller (CH1), and it is not used for this model.

(E) This block is the LSU Controller, and it consists of laser enable, power adjust and video data.

(F) This block generates 12 MHz clock signal and supply to the peripheral devices.

(G) This block is the interface with USB chip (IC8), and consists of 8-bit data bus and control signals.

(H) This block is the Centronics interface, and consists of 8-bit data bus and control signals.

(I) This block is the interface with D6004 ASIC (IC3).

(J) This block is the interface with DRAM.

4.4.6. Clock

The system clock (12.00MHz) is generated by IC6 and X3, and it is supplied to the CPU (IC1 and IC11) and USB chip through IC6, pin4. The video data clock (53.84 MHz) is generated by IC2 and X2, and it is supplied to the ASIC (IC3 and IC6).
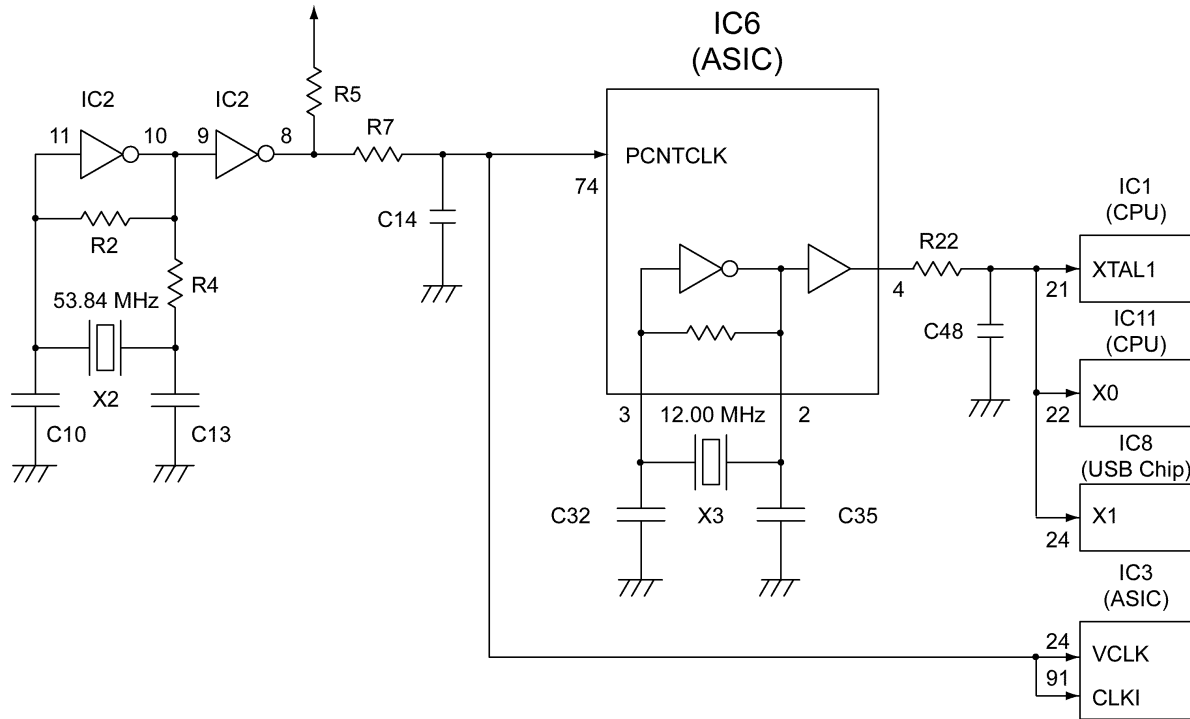
4.4.7. Reset Circuit

Reset signal is generated when the power is turned on. The reset circuit initializes the CPU (IC1 & IC11), the ASIC (IC3 & IC6) and the USB Chip. Approximately 100~800 msec after turning on the power, pin4 of IC10 goes high.
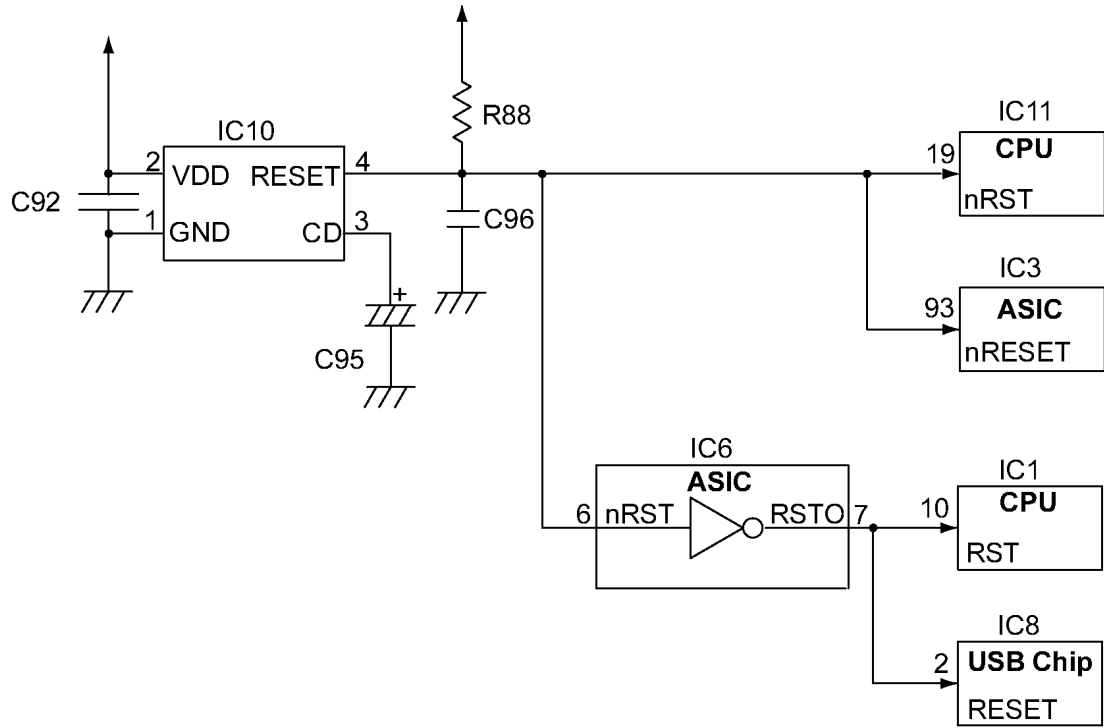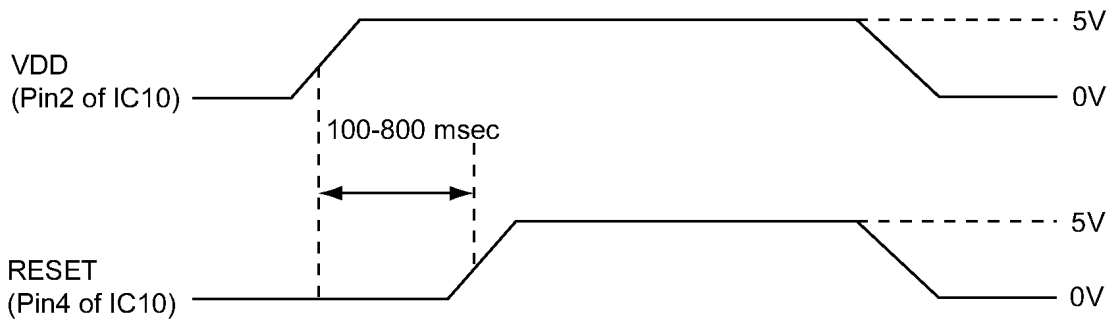
4.4.8. Main Motor Drive Circuit

The main motor (2-phase stepping motor) is driven by IC14 (bipolar constant current driver). The SMOA, SMONA, SMOB and SMONB signals shown below are used to control motor direction. when the signals are output as shown below, the main motor rotates.

Full Speed Mode (2 phase excitation):
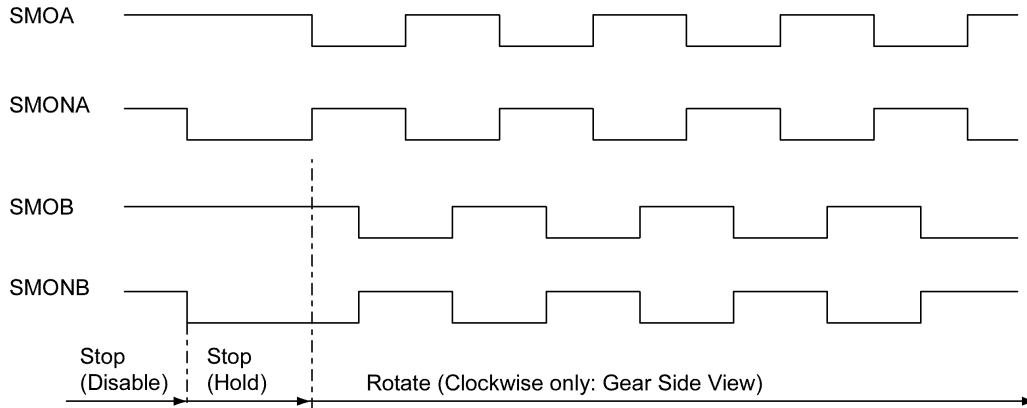
Note: If motor rotates CCW direction, Toner Cartridge and OPC Drum Unit will be damaged.

Half speed Mode (1-2 phase (half step) excitation):
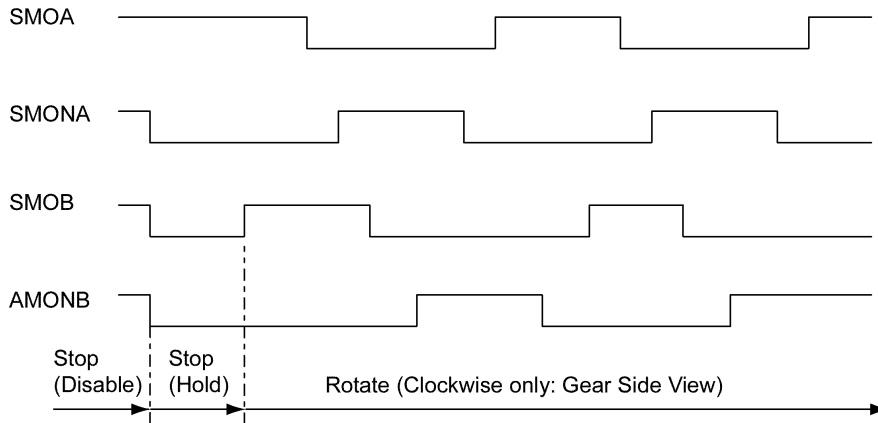
Note: If motor rotates CCW direction, Toner Cartridge and OPC Drum Unit will be damaged.

KX-P7100
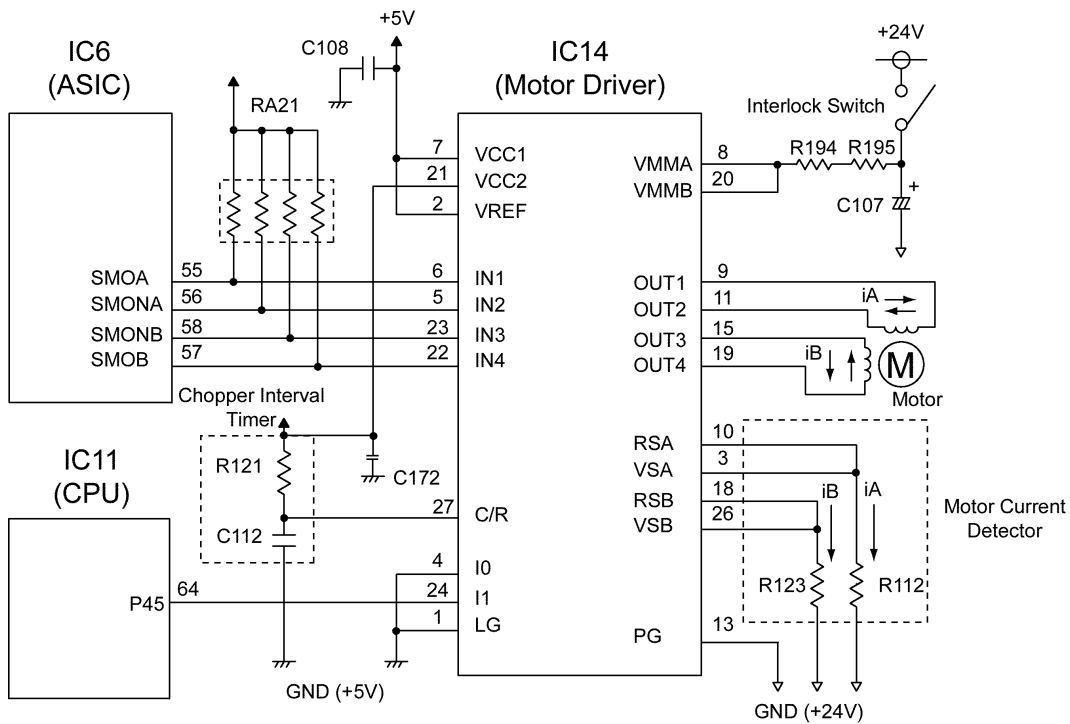
Motor Driver True Table

IN 1 or 4	IN 2 or 3	OUT 1 or 4	OUT 2 or 3
L	L	OFF	OFF
L	H	L	H
H	L	H	L
H	H	OFF	OFF

Note:

Motor Current will be cut off in case of "OFF" condition above.

Motor Driver True Table for Current Chopping Level

I0	I1	Current ratio
L	L	100%
L	H	33%

Motor Drive Mode

Mode	Speed	Current ratio
1st Hold for rotating	Stop	33%
Warm Up	Full	100%
Printing (Plain Paper / Transparency)	Full	100%
Printing (Other Media)	Half	100%
Manual Feed (Catching a Paper)	Full	100%
If printing Data is more than approx. 2.5MB	Half	100%
Last Hold after rotating	Stop	100%
Stand by / Ready / Sleep / Error	Stop	OFF

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4.4.9. Laser Scanning Unit Control Circuit

The laser unit consists of laser drive circuit and scanner motor drive circuit.

Laser control signals are as follows.

nVIDEO:	This is actual data being printed.
nLDON:	When the nLDON signal is low, the laser unit is activated.
	When front door is opened, the laser unit is deactivated.
nHSYNC:	This is a horizontal synchronizing signal sent from a timing sensor (laser beam detect sensor)
	which detects horizontal position of the laser beam across drum.
nADJUST:	When the nADJUST signal is low, APC (Auto Power Control) is activated.
nSNRCTL:	This is a control signal for the scanner motor.
nSNRLD:	The scanner motor speed is maintained at approx. 20K rpm by a PLL (Phase Locked Loop).
	While the scanner motor rotates (approx. 20K rpm), nSNRLD is low.
nSNRCLK:	This is a reference clock of the scanner motor (approx. 2KHz).
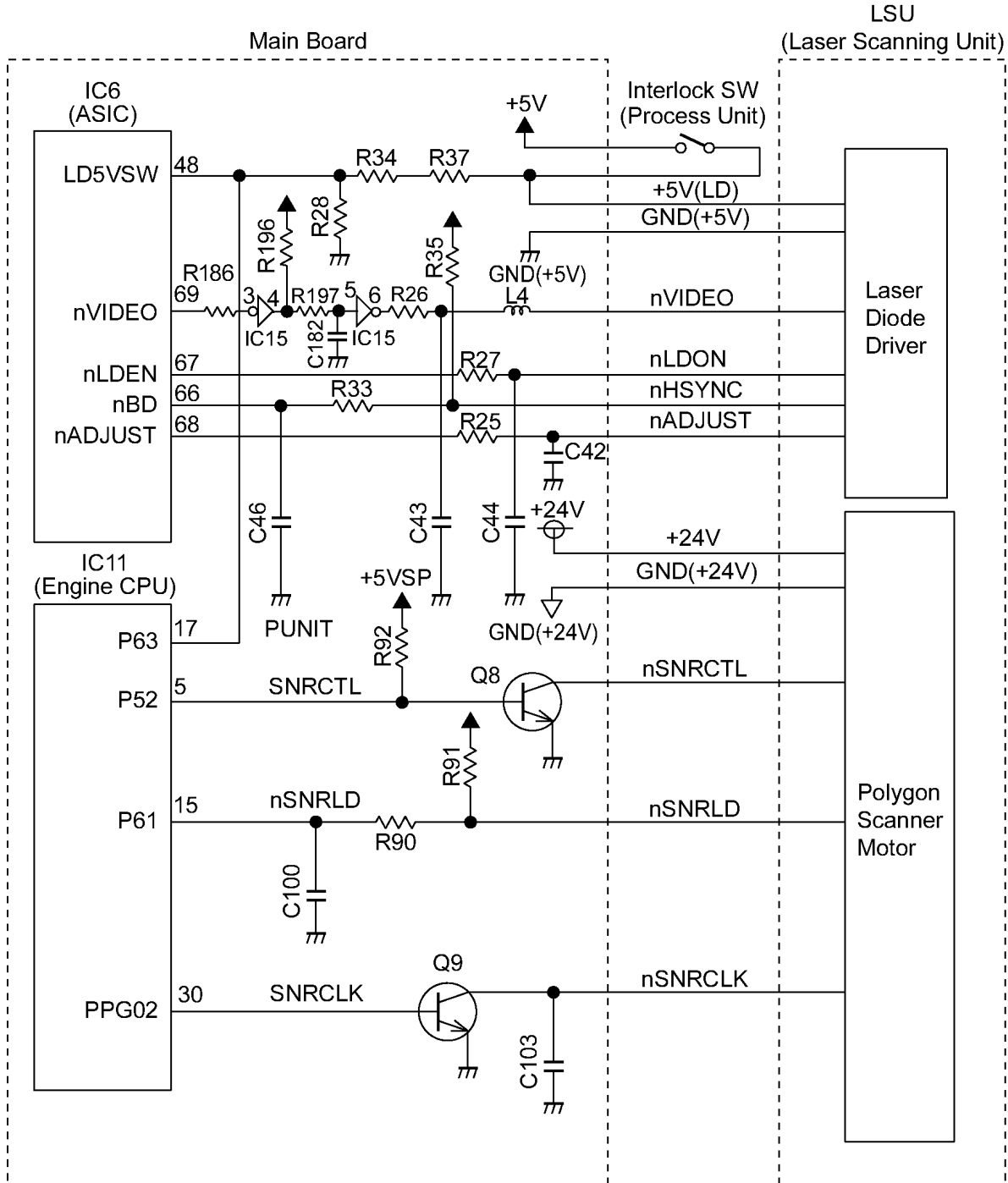
4.4.10. Fuser Temperature Control Circuit

The fuser temperature is controlled by IC11 (Engine CPU). IC11 has an analog to digital (A/D) converter (AN0-AN7). Thermistor TH is connected to IC11 (AN0). When IC11 (Pin31) is low, Q7 is turned off. And Q4 is turned on. ThenHeat lamp inside fuser unit is turned on.

Abnormal temperature detection circuit consists of the following 2 sub-sections.

1. Abnormally Low Temperature Detection

    Abnormally low temperature is detected by IC11 (Engine CPU) programming.

2. Abnormally High Temperature Detection

    Abnormally high temperature is detected by IC11 (Engine CPU) programming. When front door is opened, the fuser lamp is shut off.

Main Control Board
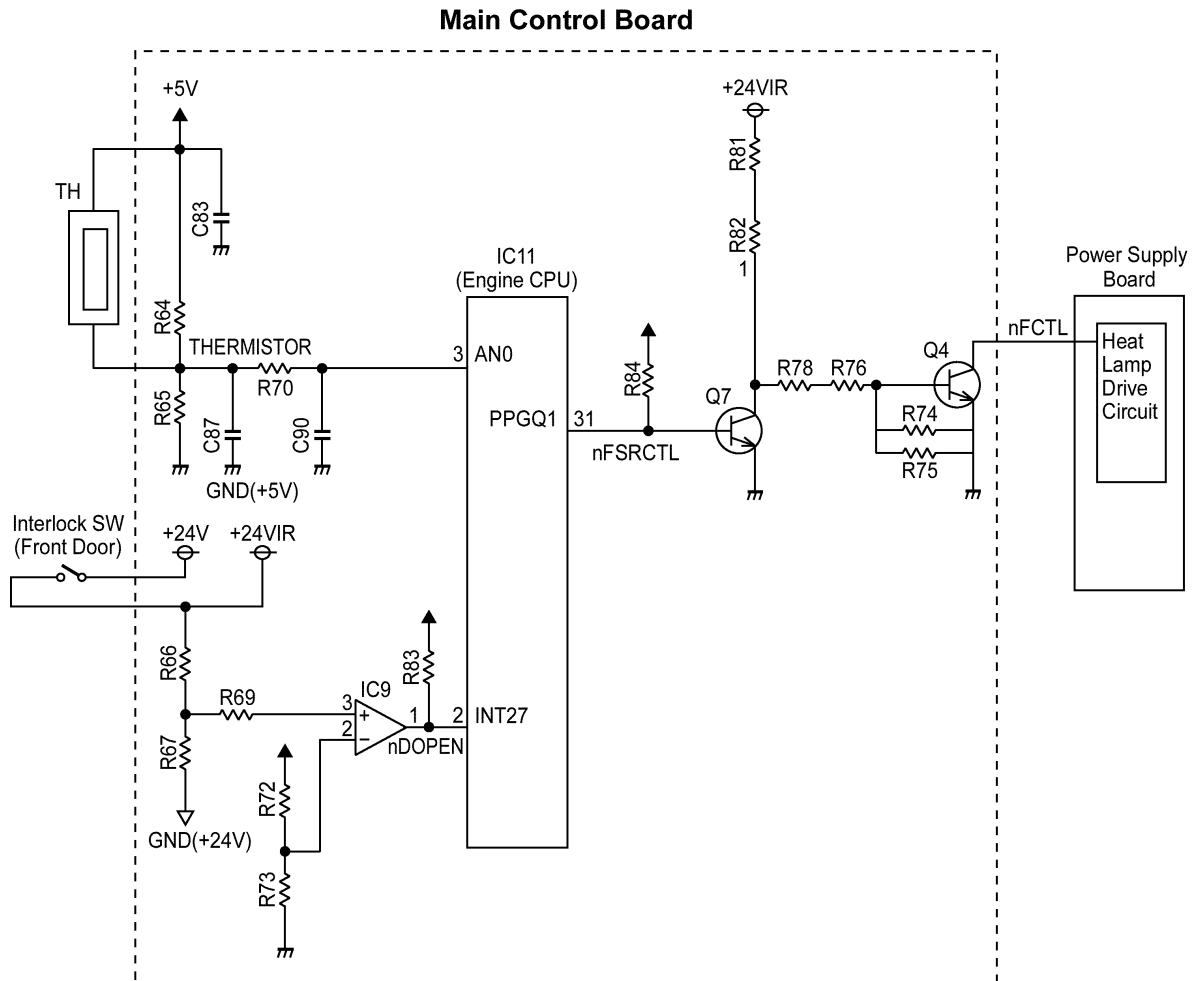
4.4.11. High Voltage Control Circuit

IMPORTANT SAFETY NOTICE

1. Do not attempt to repair this power supply unit. This supply requires proper calibration after any component replacement. Failure to do so may result in component damage, shock fire or other hazard.
2. High voltage is present on the board. Use caution when measuring voltage levels.
3. Do not power on the power supply without a load. Component damage will occur if a load is not connected to the Power Supply.

---

1. Charge Control Circuit

   This circuit consists of a DC-DC converter, which boosts +24V to approximately +5.4kV (constant current approx. +300µA) for the charge corona. nCHGCTL signal controls the charge output. If the signal goes low,the output is turned on.

2. Grid Circuit

   When the charge circuit is activated (when the signal nCHGCTL is low), this circuit is activated and approximately +900V is generated on the grid.

3. Development Bias Control Circuit

   When the charge circuit is activated (when the signal nCHGCTL is low), this circuit is activated.

   This voltage is changed between +100V and +500V in accordance with the PWM (Pulse Width Modulation) signal nDB when the signal nDBCH is low. Also approximately - 150V is generated when signal nDB and nDBCH is high.

4. Transfer Control Circuit

   This circuit consists of a DC-DC converter, which boosts +24V to -400V — -3000V (constant current).

   This current is changed between -4µA and -20µA in accordance with the PWM (Pulse Width Modulation) signal nTR when the signal nTRCTL is high.

5. Transfer Roller Cleaning Control Circuit

   This circuit consists of a DC-DC converter, which boosts +24V to +1500V.

   This voltage is generated when signal nTR is high and nTRCTL is low.

Main Control Board　　　　　　**High Voltage Board**
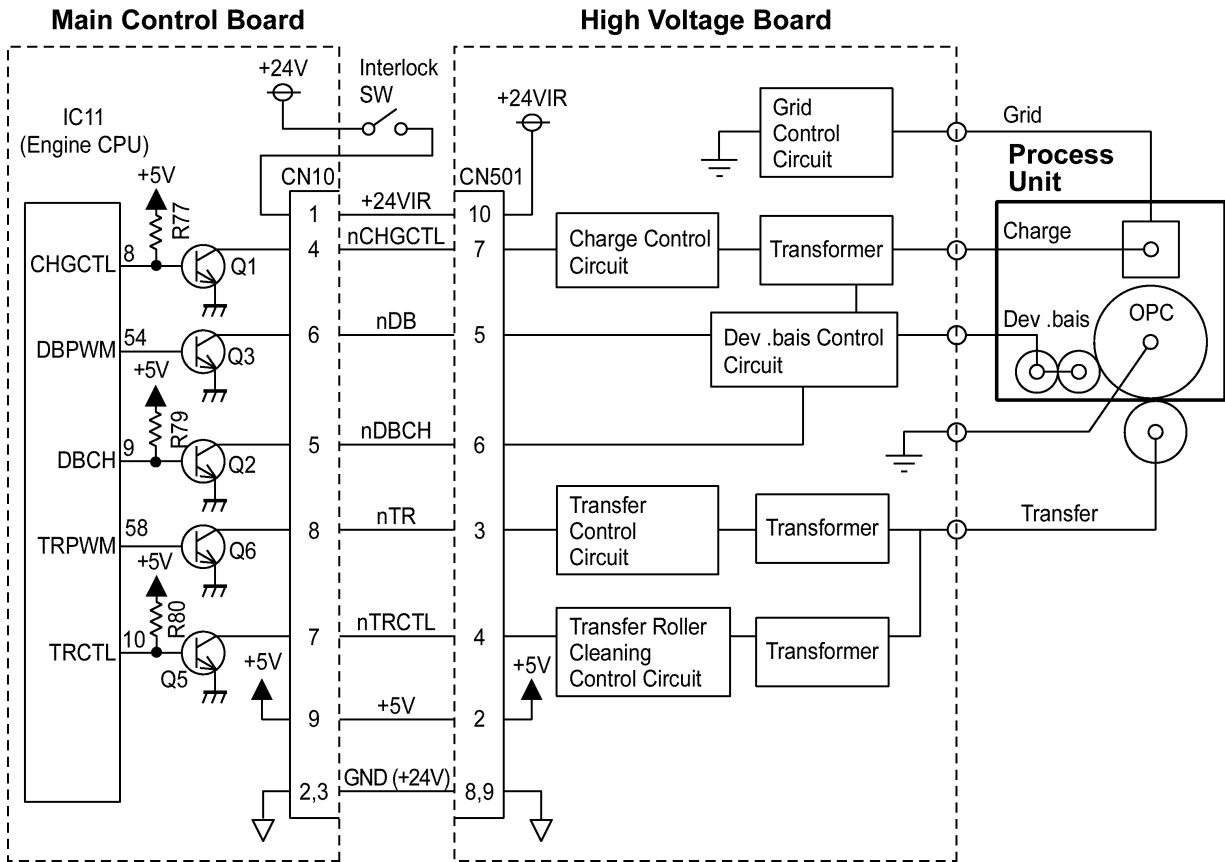
4.4.12. EEPROM Control Circuit

This printer has 2kbit EEPROM (IC12). Page Count Data, Calibration Data, etc. are saved on the IC.

The EEPROM control signals are explained as follows.

EEPCS:	This is the chip select signal.
EEPCLK:	This is the serial data transfer clock.
EEPDO:	This is the serial data from CPU (IC11) to EEPROM (IC12).
EEPDI:	This is the serial data from EEPROM (IC12) to CPU (IC11).
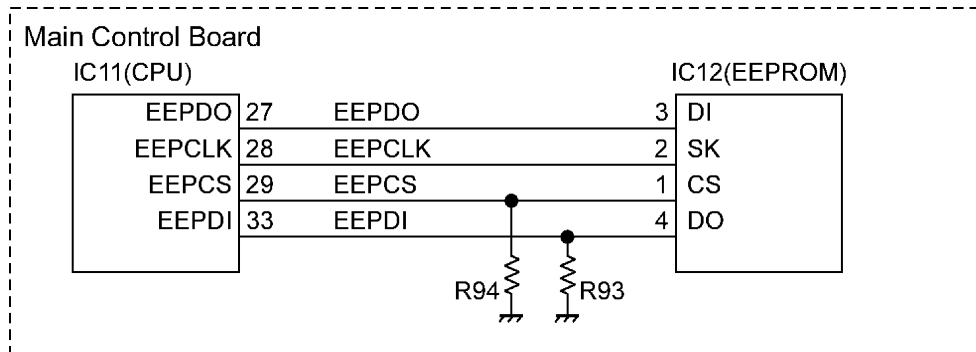
4.4.13. Safety Interlock SW

This printer has two safety interlock switches: front door safety interlock switch, and an OPC drum unit safety interlock switch. +24V power is supplied to the front door safety interlock switch. When the front door is opened, the frontdoor safety interlock switch is opened and shuts off the main motor driver power and the high voltage unit power. As a result, the comparator output at pin1 of IC9 is changed from a high level to a low level. IC11 (CPU) receives this signal and turnsoff the main motor control signal, the laser scanning unit, etc. When the OPC drum unit is not installed, the OPC drum unit safety interlock switch is opened and shuts off the +5V power for the laser diode. IC11 (CPU) and IC6 (ASIC) receivethis +5V power condition and turn off the main motor control signal, the laser control signals, etc.
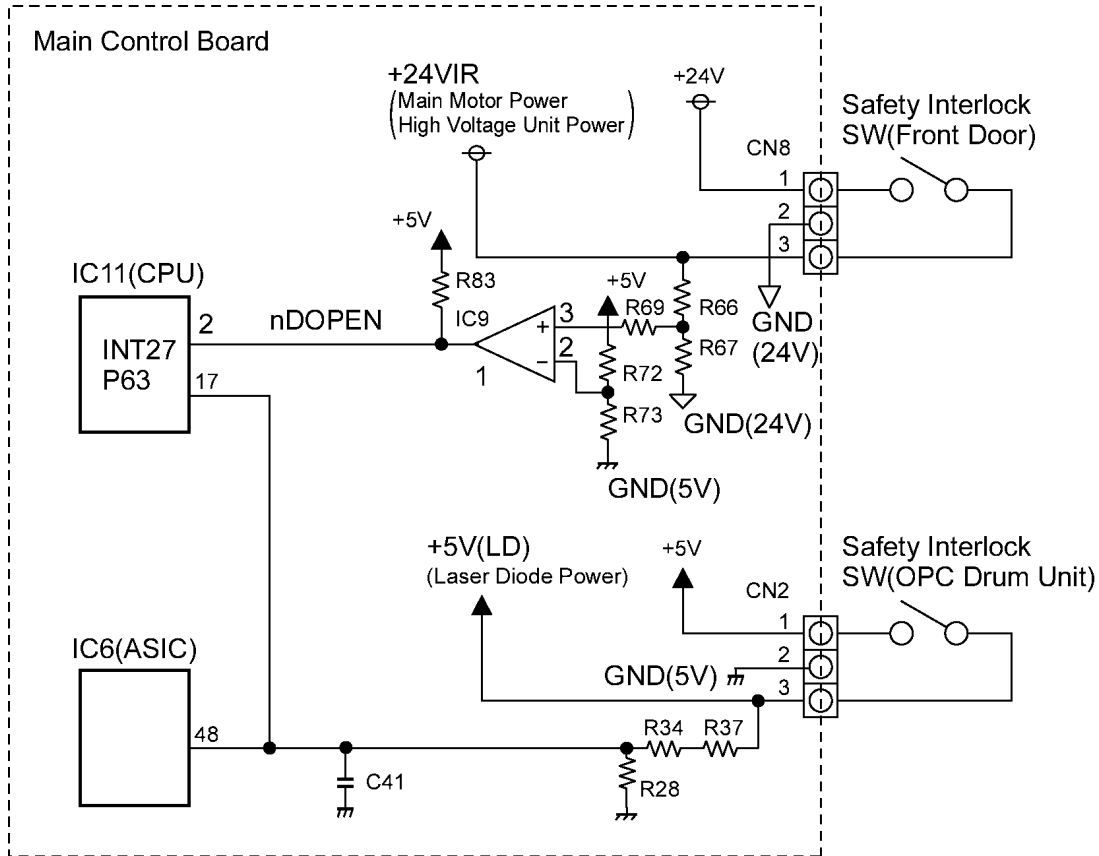
4.4.14. Solenoids Control Circuit

This printer has three solenoids: pickup solenoid, registration solenoid and a switchback solenoid.

4.4.14.1. The Pickup Control Solenoid Drive Circuit

The pickup solenoid is used for picking up the media from the media tray. The CPU IC11 outputs high level PUCTL signal from pin41 to the transistor Q20. The transistor Q20 and Q23 are turned on and supplies +24V power to the solenoid.
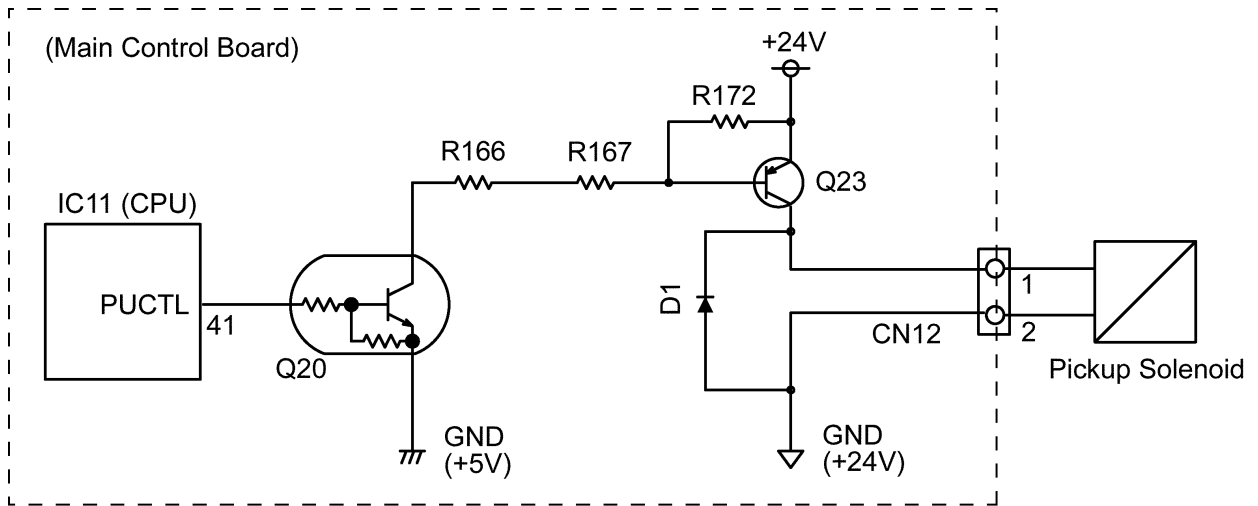
4.4.14.2. The Registration Solenoid Driver Circuit

The registration solenoid is used for controlling Registration Roller rotation. The CPU IC11 outputs high level REGCTL signal from pin42 to the transistor Q21. The transistor Q21 and Q24 are turned on and supplies +24V power to the solenoid.
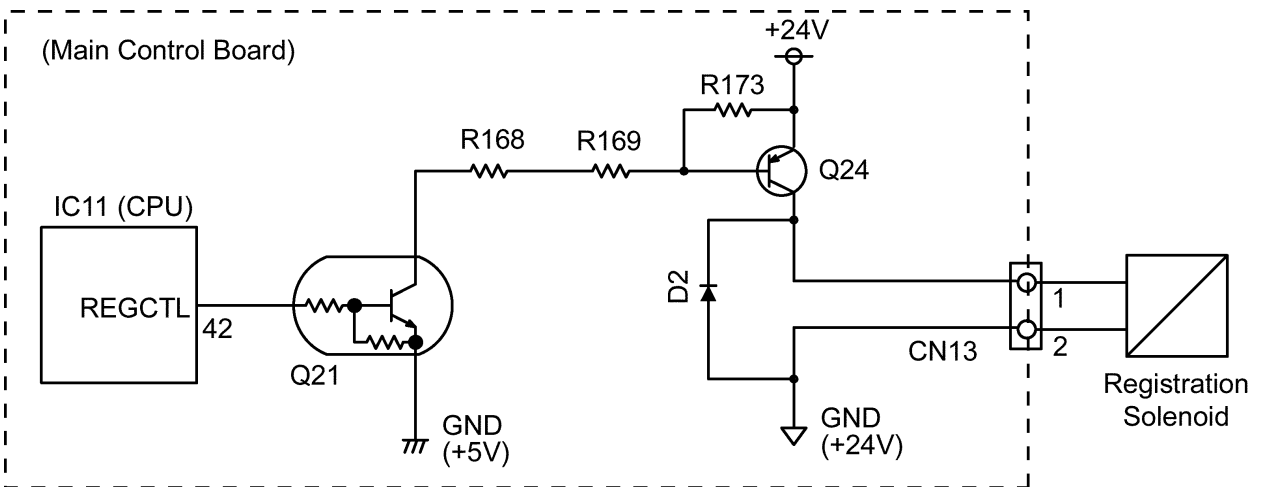
4.4.14.3. The Switchback Solenoid Drive Control Circuit

The switchback solenoid is used for controlling media switchback when the printer is auto duplex printing. The CPU IC11 outputs high level EXITCTL signal from pin43 to the transistor Q22. The transistor Q22 and Q25 are turned on and supplies +24Vpower to the solenoid.
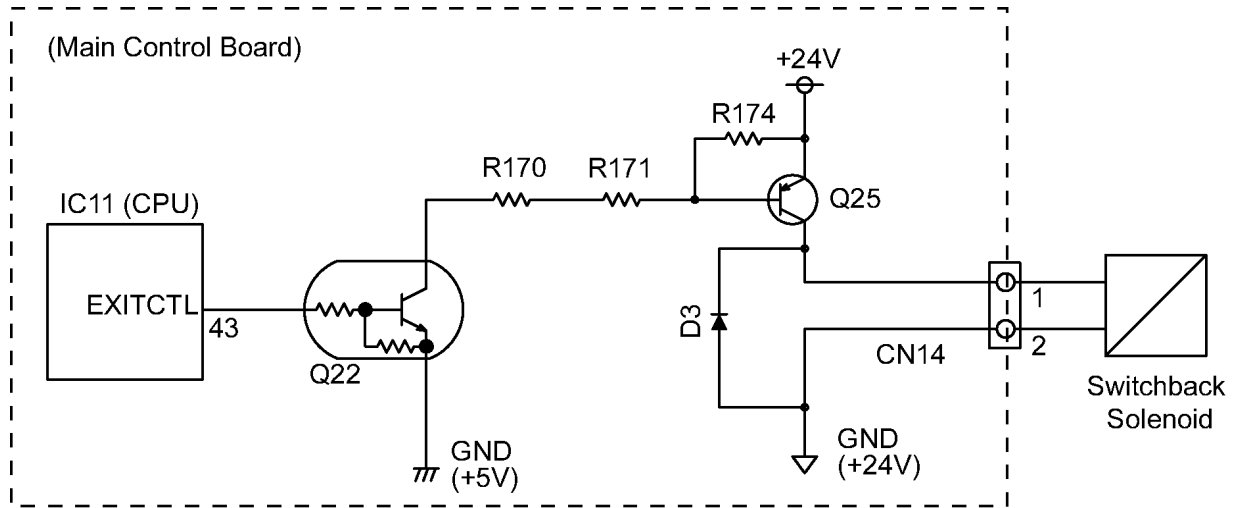
4.4.15. Sensors Circuit

The printer has three photo sensors: Registration sensor, Top sensor and Exit sensor.

4.4.15.1. Registration Sensor Circuit

Registration sensor detects that the media is in front of the Registration Roller. When the registration sensor detects the media, nREGSEN signal changes from high level to low level.
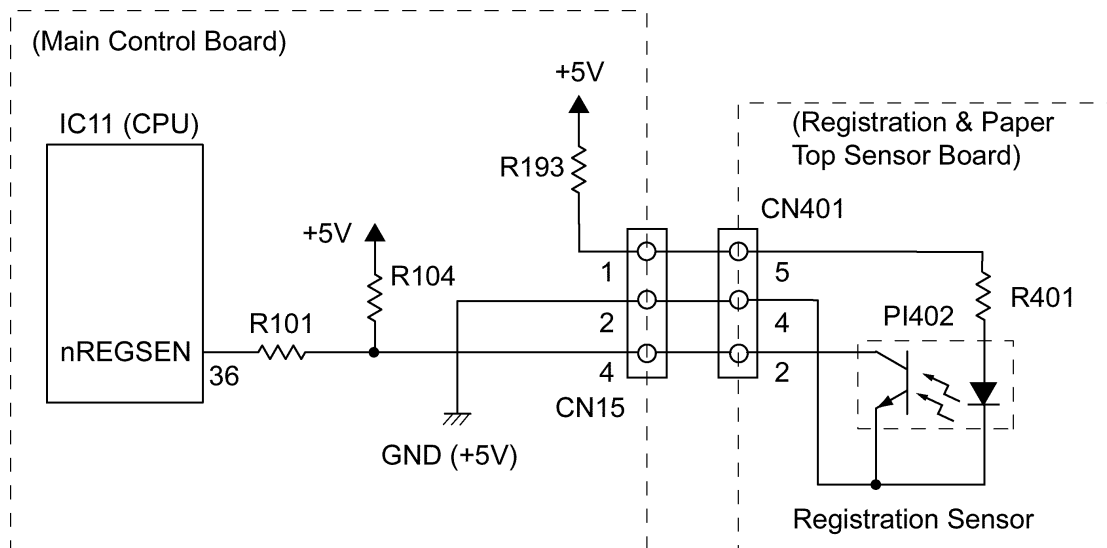
4.4.15.2. Top Sensor Circuit

Top sensor detects that the media has past the Registration Roller. When the top sensor detects the media, nTOPSEN signal changes from high level to low level. This nTOPSEN signal is used for printing start trigger and Top Margin Adjustment.
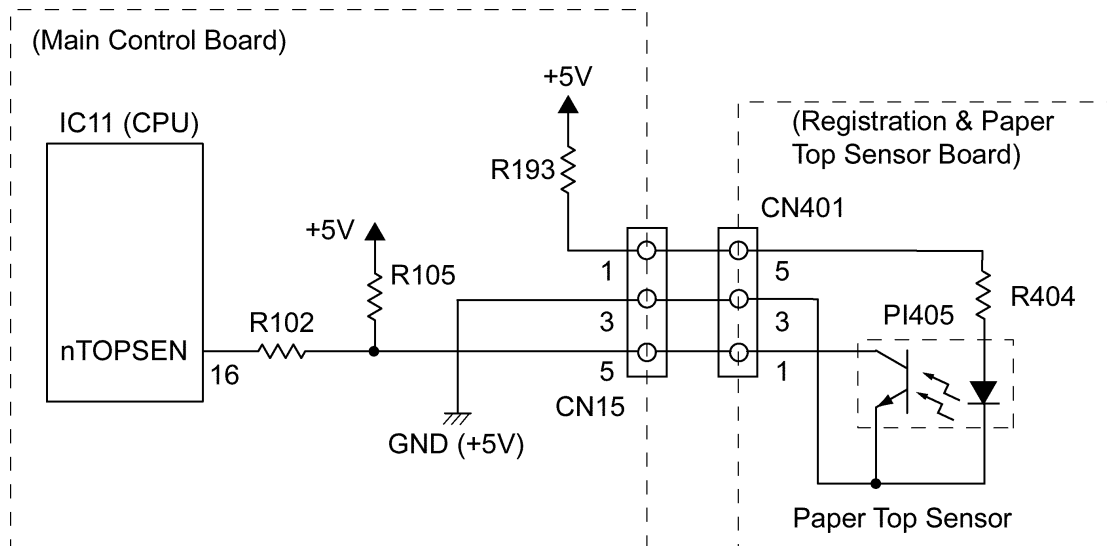
4.4.15.3. Exit Sensor Circuit

Exit sensor detects that the media is at the rear of the Fuser Roller (Exit of the printer). When the exit sensor detects the media, nEXITSEN signal changes from high level to low level. +5VSP is the power of the photo sensors. When the5VCTL signal at pin32 of IC11 (CPU) is low level, the transistor Q13 is turned on. This supplies +5V power to the photo sensors.
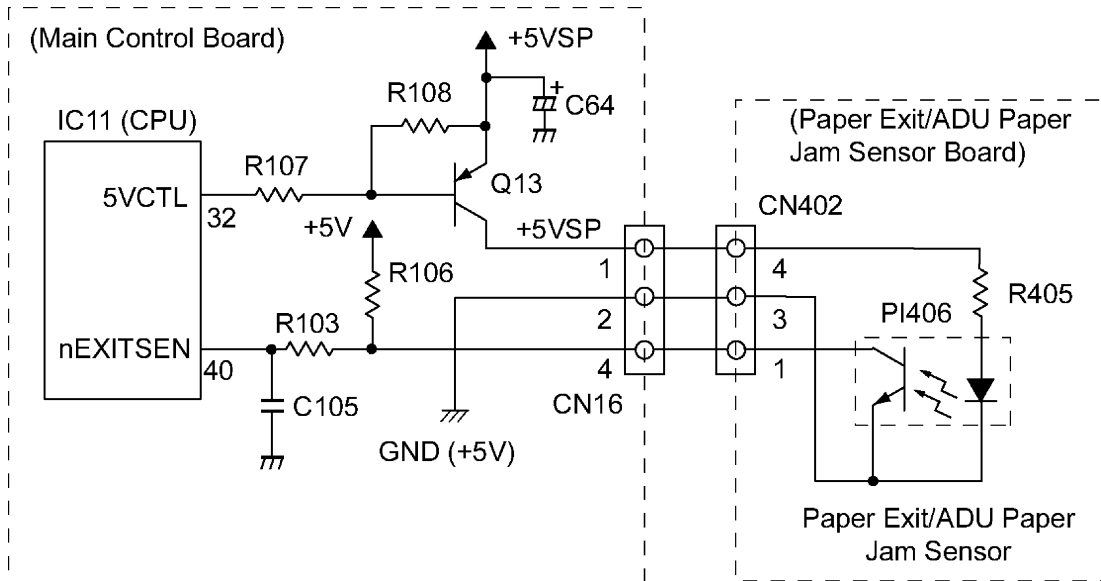
4.4.16. Fan Control Circuit

FANCTL:

1. Full Power Mode

   When FANCTL signal (pin 6, IC11) is high, pin 7 of IC9 goes high, transistors Q15 and Q17 are turned on. This supplies +24V Power to Fan motor and rotates the Fan.

2. Reducing Power Mode (Quiet Mode)

   Pulse signal (see below) is output from pin 6 of IC11.

FANCTL (IC11, Pin 6)

Approx. 5V
GND

Approx. 5msec.   Approx. 5msec.
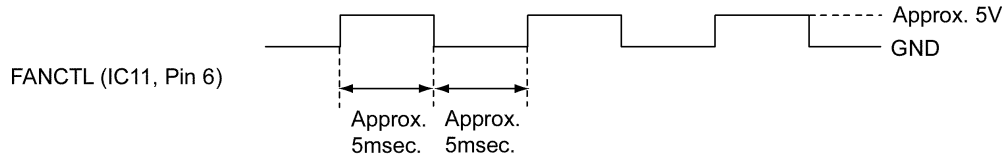
This pulse signal is integrated by R177, C181 and C175. Voltage of (A) is stabilized at approx. 2V. Pin 6 of IC9 is 0V.

When the voltage of (B) is lower than the voltage of (A), pin 7 of IC9 goes high, Q15 and Q17 are turned on, then the voltage of (B) increases. When the voltage of (B) is higher than (A), pin 7 of IC9 goes low, Q15 and Q17 are turned off,then voltage of (B) decreases. Thus the voltage of (B) is controlled almost same as the voltage of (A) (= approx. 2V). Since the resistor network of R180 and R181 divide the voltage of (C) into 1/8, the voltage of (C)is controlled approx. 16V (= 2V x 8).

FAN Control Mode

Mode	FAN Power
Warm Up	Full
Printing	Full
Others	Reduced

FANERR:

This signal is used for detecting whether the rotation of fan motor is proper or not. When the fan motor is not rotating properly or is locked, this signal becomes a high and inputted into pin18 of IC11.
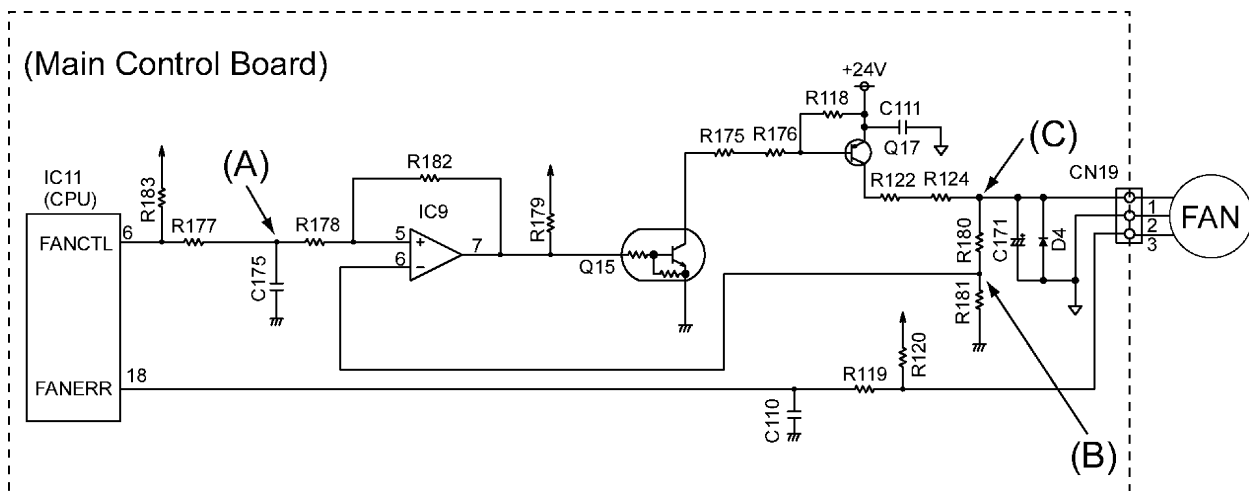
4.4.17. Internal Engine I / F (Control CPU - Engine CPU)

The communication I/F signal between Control CPU and Engine CPU in main board is as follows.

PPRDY: Printer Engine had been Powered On.
nPRDY: Engine status is ready for communication.
nTOP: A vertical synchronous signal which indicates the home position in a recording sheet.
nHSYNC: A horizontal synchronous signal which indicates the home position of horizontal laser scanning.
nPRINT: After receiving this signal from RIP CPU, the engine starts printing. By other words, print request.
nVIDEO: Video image data which modulate laser beam.
nPURGE: Paper purge signal which asserted when the paper exit to the tray.
nPSAVE: Engine power save command signal.
CXD: Serial command data from RIP to ECU.
SXD: Serial Status data from ECU to RIP.
nCBSY: Data transfer busy signal from RIP to ECU.
nSBSY: Data transfer busy signal from ECU to RIP.
CCLK: Communication clock for those serial data. (RIP assert)

(Block Diagram)
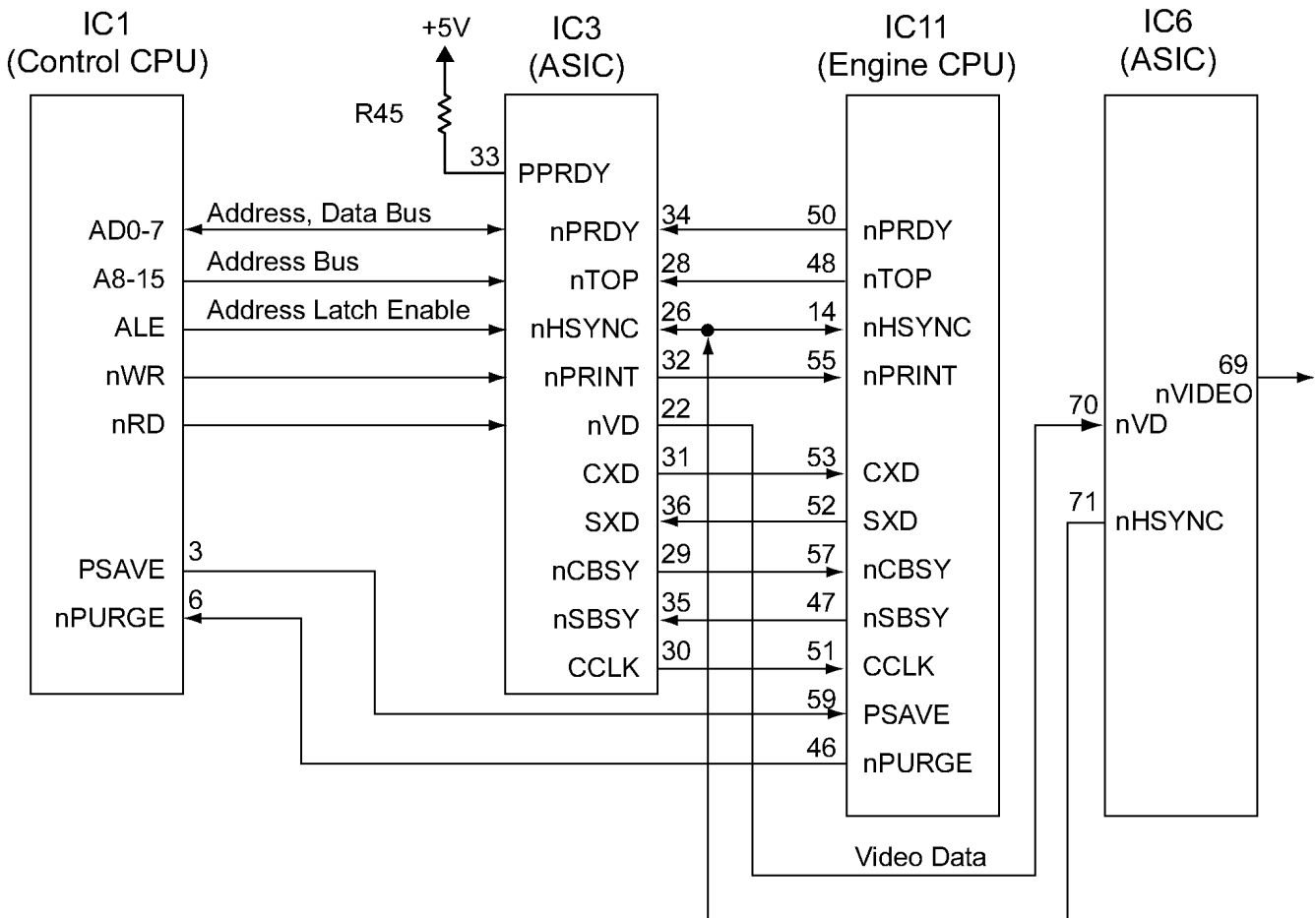
4.5. Timing Chart

4.5.1. Printing Timing

nHSYNC

Min 0.5μS

nVIDEO

Th2 = 13.1μS
(Left Margin)

Th3 = 377.7μS
(1 raster Video Data)

L : Black
H : White

Th1 = 498μS (1 Raster)

(3)

(2)

nHSYNC

Th2

Th3
(Printable Area)

Th1

(1)

(4)

Note 1 : (1), (2), (3), (4) ; Min.4.2 mm
Note 2 : Max. Paper Size : Legal

Paper
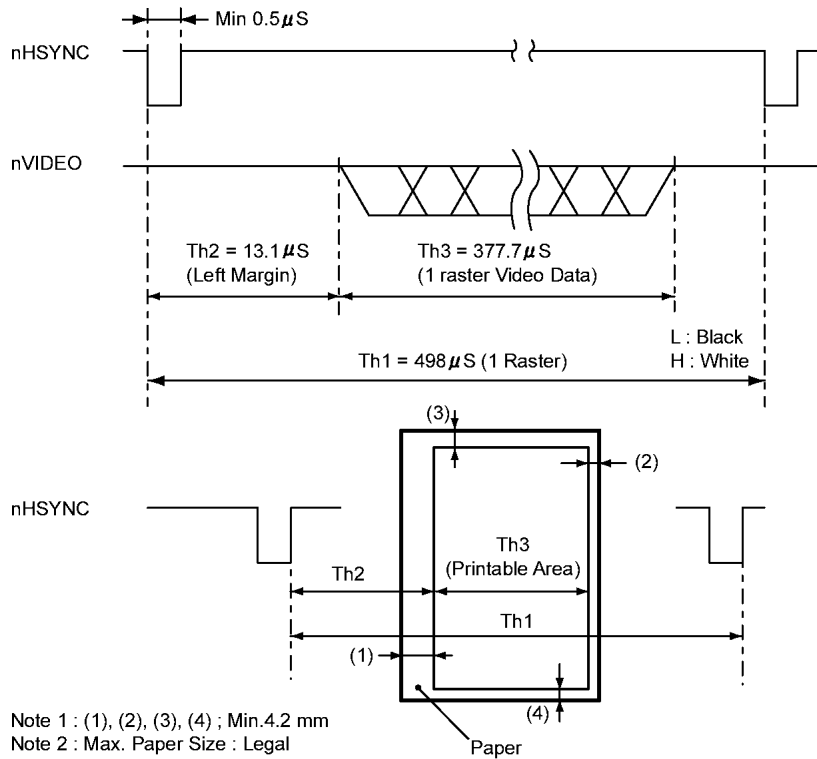
4.5.2. Horizontal Timing (Relationship between nHSYNC and Video Signal)

nHSYNC

Min 0.5μS

nVIDEO

Th2 = 13.1μS
(Left Margin)

Th3 = 377.7μS
(1 raster Video Data)

L : Black
H : White

Th1 = 498μS (1 Raster)

(3)

(2)

nHSYNC

Th2

Th3
(Printable Area)

Th1

(1)

(4)

Note 1 : (1), (2), (3), (4) ; Min.4.2 mm
Note 2 : Max. Paper Size : Legal

Paper
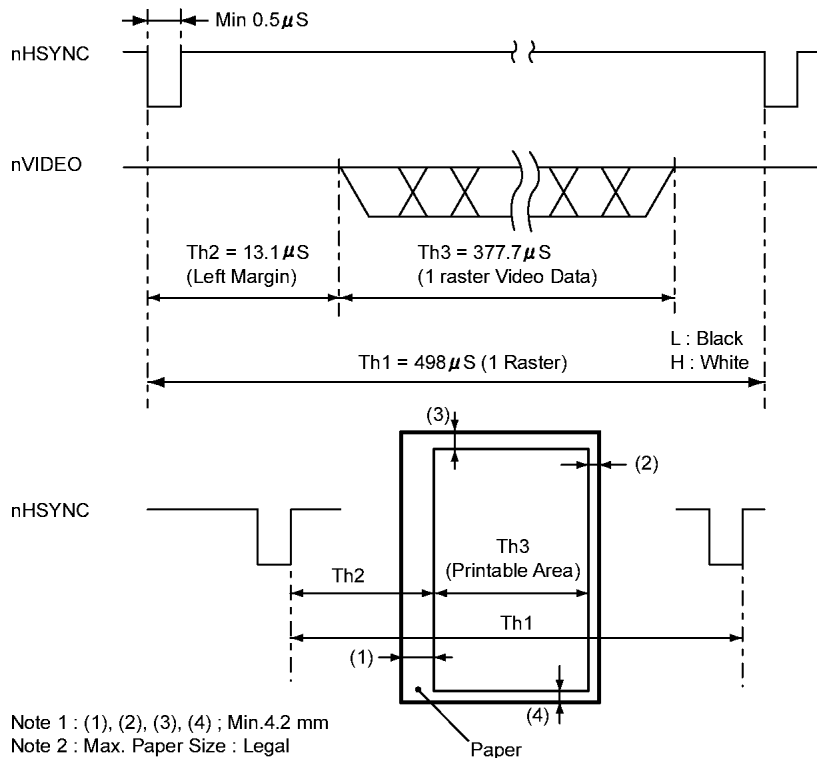
4.5.3. Engine I / F Communication

5 Schematic Diagram

5.1. Main Control Board

(Main Control Board) 1/6

KX-P7100

(Main Control Board)

2/6

KX-P7100

A B C D E F G H

C52
100p

Not Used

IC8
NC1
RESET
nSTROBE
BUSY
D0
D1
D2
D3
VCC1
GND1
D4
D5
D6
D7
VCP
D+
D-
VCC2
GND2
NC2

nSELECTIN
nAUTOFD
nINT
PERR
SELECT
nFAULT
DI
GND3
VCC3
SK
CS
nACK
NC6
PLH
NC5
X1
X2
NC4
NC3

Not Used
RA46 47

nIJSTB   001:B4

RIP_DO   001:B3
RIP_DI   001:B3

RIP_SK   001:B3
RIP_CS   001:B3

Not Used
RA44 47

RA45 47

C45 C47 C49 C50 C53
0.1u 0.1u 4.7u 4.7u

3.3V

CEND[0-7]   004:D4

RA20
R24 33

IC6
CEND[7] BI[7] AI[7] UD7
CEND[6] BI[6] AI[6] UD6
CEND[5] BI[5] AI[5] UD5
CEND[4] BI[4] AI[4] UD4
CEND[3] BI[3] AI[3] UD3
CEND[2] BI[2] AI[2] UD2
CEND[1] BI[1] AI[1] UD1
CEND[0] BI[0] AI[0] UD0

nCINIT   004:D5
nCAUTOFD   001:B4:004:D5
CSLCTIN   004:D5
nCSTB   004:D5
nCFAULT   004:E3
CSLCT   004:E3
CPEND   004:E3
CENBUSY   004:E3
nCACK   004:E3

DI[3]
DI[2]
DI[1]
DI[0]
CI[3]
CI[2]
CI[1]
CI[0]
RSTO
CLKOUT
FOI[4]
FOI[3]
FOI[2]
FOI[1]
FOI[0]
EOI[4]
EOI[3]
EOI[2]
EOI[1]
EOI[0]

nUINIT
nUSLCTIN

R21 10
R22 10

RST   001:B3
CPUCLK   001:B4:005:D3

C48 10p

R16 10k

R32 10k

R40
R41 27

R42 1.5k
R39
R38 10k

Not Used
CN4
USB Connector
VBUS
D-
D+
GND
GND(FG)
GND(FG)

USBBTYPE90

C41 C42 C43
47p 47p 47p

FG-B

PIOD[7]
PIOD[6]
PIOD[5]
PIOD[4]
PIOD[3]
PIOD[2]
PIOD[1]
PIOD[0]

ABO[7]
ABO[6]
ABO[5]
ABO[4]
ABO[3]
ABO[2]
ABO[1]
ABO[0]

EFI[4]   002:D4   nFAULT
EFI[3]   002:D4   SLCT
EFI[2]   002:D4   PEND
EFI[1]   002:D4   BUSY
EFI[0]   002:D4   nACK
nVD   002:D5   nVD
nHSYNC   002:D4:005:F2   nHSYNC_E
SEL   001:B3   1284SEL

PIOD[0-7]   002:D4

nINIT   002:D5
nAUTOFD   002:D5
SCLTIN   002:D5
nSTB   002:D4

nBD   nVIDEO
nLDEN
nADJUST
nLEDO0   nLEDO_0
nLEDO1   nLEDO_1
nLEDO2   nLEDO_2
nRAS0   002:D4   nRAS0
nRAS1   002:D4   nRAS1
nCAS   002:H3   nCAS
nRAS   002:H3   nRAS
nLCAS   002:H3   nLCAS
nUCAS   002:H3   nUCAS

R160 47
R161 47
R162 47

RA21 10k

nKEY   001:B4   R36 510

CN1
+5V
nKEY
nLEDO0
nLEDO1
nLEDO2
GND

L5
L6
L7
L8

C51 C54 C55
1000p 1000p 1000p

LS04
IC15

VCLK   001:G4:002:B3:002:B4

nRDYLED   001:B3
nERRLED   001:B4
nDRMLED   001:B4

nLED0
nLED1
nLED2

X3
12.00MHz
R13 0

CLKI
CLKR
PCNTCLK

SMA   006:D2
SMB   006:G2
SMNA   006:G2
SMNB   006:G2

SMA
SMB
SMNA
SMNB

nCS   005:G3
SCLK
SDI
SDO

SM0A
SM0B
SM0NA
SM0NB
SM1A
SM1B
nSM1EN
nTRST
LD5VSW
nRST

VDD
VDD
VDD
GND
GND
GND
VSS
VSS
VSS

PUNIT   005:D3

CN2
P.U SW
+5V
5VGND
+5V(LD)

RA16
2.2k

nCS   005:G3
SCK2   005:G3
SO2   005:G3
SI2   005:G3

C32 C35
10p 10p

Not Used

C150 C151 C152 C153
100p 100p 100p 100p

Not Used

C33 C34 C36 C37
0.1u 0.1u 0.1u 0.1u

Not Used
(The line is directly connected
to GND by pattern.)

002:B4:005:E4   nRST

C41 C42
1000p 270p

R28 5.1k

R34 510
R37 510

R186 220

R19 2.2k

LS04
IC15

+5VIR

R197 R26 100

C57
1180p

L4

C60
47u

CN3
LD
+5V(LD)
5VGND
nVIDEO
5VGND
nLDON
nHSYNC
nADJUST

R192 100p

C43 1180p

C27 100

C54
270p

R33 100
R35 10k

C64 100p

+5VIR
R190 100

R192 47

C18 0.1u
Not Used

C177 0.1u
IC15

VCC
GND
LS04

LS04
IC15

POWER<+5V>   POWER<+24V>   +24V
POWER<+5VLD>   POWER<+24VIR>   +24VIR
POWER<+5VSP>   GND<+24V>   +5VIR
GND<+5V>   F.G.
                  FG-A FG-B FG-C FG-D FG-E

(Main Control Board)   3/6

KX-P7100

(Main Control Board)

4/6

KX-P7100

(Main Control Board)

5/6

KX-P7100

A   B   C   D   E   F   G   H

+24V

R166   R167   R172
1/10W   1/10W   10k
2.2k   2.2k   Q23

PUCTL 005:F5
Q20

CN12   P/U_SOL
D1
1 PUSOL_CTL
2 +24VGND

+24VIR   R194   R195
0   0
C107
47u

C108   IC14   C172
0.1u

Not Used
R151

I0_CTL 005:F5
SMNA 003:F4
SMA 003:F4

1 LG   C/R 27
2 VREF   VSB 26
3 VSA   NC5 25
4 IO   I1   24   005:G3 I1_CTL
5 IN2   IN3 23   003:F4 SMNB
6 IN1   IN4 22   003:F4 SMB
7 VCC1   VCC2 21
8 VMMA   VMMB 20
9 OUT1   OUT4 19
10 RSA   RSB 18
11 OUT2   OUT3 17
12 NC1   NC4 16
13 PG   NC3 15
14 NC2   OUT3

C112   R121
3300p 10k

Not Used
R152   C173
0   0.1u

R112
0.47
1W

R123
0.47
1W

C174
0.1u

Not Used
(The line is directly connected
to GND by pattern.)

+24V

R168   R169   R173
1/10W   1/10W   10k
2.2k   2.2k   Q24

REGCTL 005:F5
Q21

CN13   REG_SOL
D2
1 REGSOL_CTL
2 +24VGND

CN18   MAIN MOTOR
(STEPPER)
1 AOUT
2 nAOUT
3 nBOUT
4 BOUT

Not Used
(The line is directly
connected by pattern.)
R113
0

2800 μs

+24V

R170   R171   R174
1/10W   1/10W   10k
2.2k   2.2k   Q25

EXITCTL 005:F5
Q22

CN14   EXIT_SOL
D3
1 EXITSOL_CTL
2 +24VGND

+24V
R118
10k
C111
0.1u
Q17

R175   R176
2.2k   2.2k
1/10W 1/10W

R182
1M

R183
10k
IC9
R179
2.2k

R122   R124
12   12
1/2W   1/2W

CN19   FAN
1 FANPWR
2 24VGND
3 FANERR

FANCTL 005:F2
R177   R178
220k   18k

5
6   7
Q15

C64
47u

R108
4.7k   Q13

5VCTL 005:D4
R107
2.2k
+5VSP

C170
1000p

Not Used

R180
30k

R171
4.7k

R120
10k

C171
47u   D4

Not Used

C181 C175
1u
Not Used

Not Used
R136   R191
10   10
C118   C180
1000p 1000p
FG-A

R119
510
C110
1000p

FANERR 005:D3

(In case of reduced power mode)

CN15   REG-TOP
R193
1 +5V
2 5VGND
3 5VGND
4 nREGSEN
5 nTOPSEN

R104   R105
10k   10k

nREGSEN 005:F5
nTOPSEN 005:F2

R101   510
R102   510

C104   C106
1000p 1000p

R129   R132
10   10
C114   C116
1000p 1000p
FG-C

R138
10
C120
1000p
FG-E

CN16   EXIT
R106
10k
1 +5VSP
2 5VGND
3 5VGND
4 nEXITSEN

+5VSP

nEXITSEN 005:F5
R103   510
C105
1000p

R130   R133
10   10
C115   C117
1000p 1000p
FG-D

R137   R139
10   10
C119   C121
1000p 1000p
FG-B

POWER<+5V>   POWER<+24V>   +24V
POWER<+5VLD> +5VLD POWER<+24VIR>   +24VIR
POWER<+5VSP> +5VSP GND<+24V>
GND<+5V>   F.G.
FG-A FG-B FG-C FG-D FG-E

(Main Control Board)   6/6

KX-P7100

5.2. Sensors, Indicator and Relay Boards

JAM SENSOR(REGISTRATION,TOP)

PJUP1055Z-a

TONER EMPTY SENSOR(R)

PJUP1055Z_d

JAM SENSOR(EXIT)

PJUP1055Z-b

RESISTOR RELAY PCB a

PJUP1055Z_e

INDICATOR

PJUP1055Z-c

RESISTOR RELAY PCB b

PJUP1055Z_f

(Sensors, Indicator and Relay Boards)

KX-P7100   1/1

6 Explanation of Connectors

6.1. Main Board

6.1.1. CN1 (to Front Panel)

CN1 (to Front Panel)

Pin No.	Signal Name	Description	Direction
1	+5V	----	OUT
2	nKEY	Key Input	IN
3	nLEDO 0	Ready LED (Green)	OUT
4	nLEDO 1	Error LED (Red)	OUT
5	nLEDO 2	Toner LED (Yellow)	OUT
6	5VGND		---

6.1.2. CN2 (OPC Drum Unit Interlock SW)

CN2 (OPC Drum Unit Interlock Switch)

Pin No.	Signal Name	Description	Direction
1	+5V	+5V	OUT
2	5VGND	---	---
3	+5V (LD)	+5V after thru OPC Drum Unit Interlock SW	IN

6.1.3. CN3 (LSU Control Signals)

CN3 (LSU Control Signals)

Pin No.	Signal Name	Description	Direction
1	+5V (LD)	+5V after thru OPC Drum Interlock SW	OUT
2	5VGND	------	---
3	nVIDEO	Video Signal	OUT
4	5VGND	-----	---
5	nLDON	LD Light Enable	OUT
6	nHSYNC	Horizontal Sync Signal (BD)	IN
7	nADJUST	LSU APC timing	OUT

6.1.4. CN4 (USB I / F Connector)

CN4 (USB Interface Connector)

Pin No.	Signal Name	Description	Direction
1	VBUS	N.C.	---
2	D-	USB Differential Data -	IN / OUT
3	D+	USB Differential Data +	IN / OUT
4	GND	---	---
5	GND(FG)	---	---
6	GND(FG)	---	---

6.1.5. CN6 (Centronics Parallel I / F)

CN6 (Centronics Parallel I/F)

Pin No.	Signal Name	Description	Direction
1	nCSTROBEZ	Centronics Strobe	IN
2	CCEND0	Centronics Data 1	IN/OUT
3	CCEND1	Centronics Data 2	IN/OUT
4	CCEND2	Centronics Data 3	IN/OUT
5	CCEND3	Centronics Data 4	IN/OUT
6	CCEND4	Centronics Data 5	IN/OUT
7	CCEND5	Centronics Data 6	IN/OUT
8	CCEND6	Centronics Data 7	IN/OUT
9	CCEND7	Centronics Data 8	IN/OUT
10	nCACKZ	Centronics Acknowledge	OUT
11	CBUSY	Centronics Busy	OUT
12	CCPE	Centronics Paper Error	OUT
13	CSEL	Centronics Select	OUT
14	nCAUTOFD	Centronics Autofeed	IN
15	NC	-----	---
16	GND	Signal Ground	---
17	FG	Frame Ground	---
18	VCC	+5V	---
19	GND	Signal Ground	---
20	GND	Signal Ground	---
21	GND	Signal Ground	---
22	GND	Signal Ground	---
23	GND	Signal Ground	---
24	GND	Signal Ground	---
25	GND	Signal Ground	---
26	GND	Signal Ground	---
27	GND	Signal Ground	---
28	GND	Signal Ground	---
29	GND	Signal Ground	---
30	GND	Signal Ground	---
31	nCINIT	Centronics Initiative	IN
32	nCCFAULT	Centronics Fault	OUT
33	GND	Signal Ground	---
34	NC	------	---
35	NC	----	---
36	nCSLCTINZ	Centronics Select In	IN

6.1.6.   CN7 (PSU-MAIN Connector)

CN7 (PSU-MAIN Connector)

Pin No.	Signal Name	Description	Direction
1	nFCTL	Fuser ON/OFF Control	OUT
2	5VGND	GND for +5V	---
3	+5V	+5V from Power Source (PSU)	IN
4	24VGND	GND for +24V	---
5	24VGND	GND for +24V	---
6	+24V	+24V from Power Source (PSU)	IN
7	+24V	+24V from Power Source (PSU)	IN

6.1.7.   CN8 (Door + 24V Interlock SW)

CN8 (Door +24V Interlock SW)

Pin No.	Signal Name	Description	Direction
1	+24V	+24V Power Source	OUT
2	24VGND	GND for +24V	---
3	24VIR	24V after through Front Door Interlock SW	IN

6.1.8.   CN9 (THERMISTOR)

CN9 (Thermistor)

Pin No.	Signal Name	Description	Direction
1	+5V	---	OUT
2	TH	Thermistor	IN

6.1.9.   CN10 (HVU-MAIN Connector)

CN10 (HVU-MAIN Connector)

Pin No.	Signal Name	Description	Direction
1	+24VIR	---	OUT
2	24VGND	---	---
3	24VGND	---	---
4	nCHGCTL	Charge Control (on/off)	OUT
5	nDBCH	Developer Charge (+/- change)	OUT
6	nDB	Developer (+ voltage PWM Pulse)	OUT
7	nTRCTL	Transfer Control(+/- change)	OUT
8	nTR	Transfer (- voltage PWM Pulse)	OUT
9	+5V	---	OUT
10	nTECTL	Toner Empty LED Control	OUT

6.1.10. CN11 (Polygon Motor)

CN11 (Polygon Motor)

Pin No.	Signal Name	Description	Direction
1	nSNRCLK	Scanner Clock	OUT
2	nSNRLD	Scanner Lock	IN
3	nSNRCTL	Scanner Control	OUT
4	24VGND	------	---
5	+24V	------	OUT

6.1.11. CN12 (Pickup Solenoid)

CN12 (Pickup Solenoid)

Pin No.	Signal Name	Description	Direction
1	PUSOL_CTL	Pick Up Solenoid Control	OUT
2	+24VGND	------	---

6.1.12. CN13 (Registration Solenoid)

CN13 (Registration Solenoid)

Pin No.	Signal Name	Description	Direction
1	REGSOL_CTL	Registration Solenoid Control	OUT
2	+24VGND	------	---

6.1.13. CN14 (Switchback Solenoid)

CN14 (Switchback Solenoid)

Pin No.	Signal Name	Description	Direction
1	EXITSOL_CTL	Switchback Solenoid Control	OUT
2	+24VGND	------	---

6.1.14. CN15 (REG-TOP Sensor)

CN15 (REG-TOP Sensor)

Pin No.	Signal Name	Description	Direction
1	+5V	+5V	OUT
2	5VGND	GND	---
3	5VGND	GND	---
4	nREGSEN	REGISTLATION Sensor	IN
5	nTOPSEN	TOP Sensor	IN

6.1.15. CN16 (EXIT Sensor)

CN16 (EXIT Sensor)

Pin No.	Signal Name	Description	Direction
1	+5VSP	+5V (Power Save Controlled)	OUT
2	5VGND	GND	---
3	5VGND	GND	---
4	nEXITSEN	EXIT Sensor	IN

6.1.16. CN18 (MAIN Motor)

CN18 (Main Motor)

Pin No.	Signal Name	Description	Direction
1	AOUT	MOTOR_A	OUT
2	nAOUT	MOTOR_$\overline{\text{A}}$	OUT
3	nBOUT	MOTOR_$\overline{\text{B}}$	OUT
4	BOUT	MOTOR_B	OUT

6.1.17. CN19 (FAN Control)

CN19 (Fan Control)

Pin No.	Signal Name	Description	Direction
1	FANPWR	+24V Fan Power	OUT
2	24VGND	GND	---
3	FANERR	Fan Error Signal (H: Fan Error Occur)	IN

6.1.18. CN20 (Toner Empty Sensor)

CN20 (Toner Empty Sensor)

Pin No.	Signal Name	Description	Direction
1	TE_ROUT	Toner Empty Sensor	IN
2	+5VGND	GND	---

6.2. Registration & Paper Top Sensor Board

6.2.1. CN401 (REG-TOP Sensor)

CN401 (REG-TOP Sensor)

Pin No.	Signal Name	Description	Direction
1	nTOPSEN	TOP Sensor	OUT
2	nREGSEN	Registration Sensor	OUT
3	5VGND	GND	---
4	5VGND	GND	---
5	+5V	+5V	IN

6.3. Paper Exit / ADU Paper Jam Sensor Board

6.3.1. CN402 (EXIT Sensor)

CN402 (EXIT Sensor)

Pin No.	Signal Name	Description	Direction
1	nEXITSEN	EXIT Sensor	OUT
2	5VGND	GND	---
3	5VGND	GND	---
4	+5VSP	+5V (Power Save Controlled)	IN

6.4. Indicator Board

6.4.1. CN406 (to Main Board CN1)

CN406 (to Main Board CN1)

Pin No.	Signal Name	Description	Direction
1	5VGND	---	---
2	nLEDO2	Toner/Process LED (Yellow)	IN
3	nLEDO1	ERROR LED (Red)	IN
4	nLEDO0	Ready LED (Green)	IN
5	nKEY	Key Input	OUT
6	+5V	---	IN

6.5. Relay Board (B)

6.5.1. CN407 (Fuser GND)

CN407 (Fuser GND)

Pin No.	Signal Name	Description	Direction
1	NC	------	---
2	Fuser GND	Fuser GND	---
3	NC	------	---

6.6. Toner Empty Sensor Board

6.6.1. CN451 (Toner Empty Sensor)

CN451 (Toner Empty Sensor)

Pin No.	Signal Name	Description	Direction
1	TE_ROUT	Toner Empty Sensor	OUT
2	+5VGND	GND	---

7 Component Reference Guide

7.1. IC1 (Main Control CPU)

IC1 (Main Control CPU)

Pin No.	Symbol	In/Out	Function	Pin No.	Symbol	In/Out	Function
1	NC1	-	N.C.	23	NC3	-	N.C.
2	P10	Out	I/F selector signal	24	A8	Out	Address8
3	P11	Out	Power save signal	25	A9	Out	Address9
4	P12	-	(not used)	26	A10	Out	Address10
5	P13	Out	LED (Ready) contorl signal	27	A11	-	N.C.
6	P14	In	Purge signal	28	A12	-	N.C.
7	P15	-	(not used)	29	A13	-	N.C.
8	P16	-	(not used)	30	A14	-	N.C.
9	P17	-	(not used)	31	A15	-	N.C.
10	RST	In	System reset	32	nPSEN	-	N.C.
11	RXD	Out	LED (Error) contorl signal	33	ALE	Out	Address latch enable
12	NC2	-	N.C.	34	NC4	-	N.C.
13	TXD	Out	LED (PU) contorl signal	35	nEA	-	+5V
14	nINT0	In	Intterrupt0	36	AD7	In/Out	Address/Data7
15	nINT1	In	Intterrupt1	37	AD6	In/Out	Address/Data6
16	T0	-	(not used)	38	AD5	In/Out	Address/Data5
17	T1	In	Key detection signal	39	AD4	In/Out	Address/Data4
18	nWR	Out	Write signal	40	AD3	In/Out	Address/Data3
19	nRD	Out	Read signal	41	AD2	In/Out	Address/Data2
20	XTAL2	-	N.C.	42	AD1	In/Out	Address/Data1
21	XTAL1	In	System clock	43	AD0	In/Out	Address/Data0
22	GND	-	GND	44	VCC	-	+5V

7.2. IC2 (Inverters)

IC2 (Inverters)

Pin No.	Symbol	In/Out	Function		
1	1A	In			
2	1Y	Out		A(In)	Y(Out)
3	2A	In		L	H
4	2Y	Out		H	L
5	3A	In			
6	3Y	Out			
7	GND	-	GND		
8	4Y	Out			
9	4A	In		A(In)	Y(Out)
10	5Y	Out		L	H
11	5A	In		H	L
12	6Y	Out			
13	6A	In			
14	VCC	-	+5V		

7.3. IC3 (GDI ASIC)

IC3 (GDI ASIC)

Pin No.	Symbol	In/Out	Function	Pin No.	Symbol	In/Out	Function
1	PEND	Out	Paper End signal	51	nRAS1	Out	Memory row address strobe
2	BUSY	Out	Busy signal	52	nRAS0A	Out	Bank 0 chip select signal
3	nACK	Out	Acknowledge signal	53	nRAS0B	-	N.C.
4	nSTROB	In	Data strobe signal	54	nCAS	Out	Memory column address strobe
5	VSS	-	GND	55	nMOE	Out	Memory output enable signal
6	PIOD7	In/Out	Bi-directional data7	56	nMWE	Out	Memory write signal
7	VDD	-	+5V	57	VSS	-	GND
8	PIOD6	In/Out	Bi-directional data6	58	MA10	-	N.C.
9	PIOD5	In/Out	Bi-directional data5	59	MA11	-	N.C.
10	PIOD4	In/Out	Bi-directional data4	60	MA12	-	N.C.
11	PIOD3	In/Out	Bi-directional data3	61	MA13	-	N.C.
12	PIOD2	In/Out	Bi-directional data2	62	MA14	-	N.C.
13	PIOD1	In/Out	Bi-directional data1	63	MD7	In/Out	Memory data7
14	PIOD0	In/Out	Bi-directional data0	64	VDD	-	+5V
15	PCLK	-	N.C.	65	MD6	In/Out	Memory data6
16	VDD	-	+5V	66	VDD	-	+5V
17	SIOAO	In/Out	GND (via 10k ohm)	67	MD5	In/Out	Memory data5
18	nSIOCS	-	N.C.	68	MD4	In/Out	Memory data4
19	SIOWR	-	N.C.	69	MD3	In/Out	Memory data3
20	SIORD	-	N.C.	70	MD2	In/Out	Memory data2
21	VDO1	-	N.C.	71	MD1	In/Out	Memory data1
22	VDO0	Out	Video data	72	VSS	-	GND
23	DOTCLK	-	N.C.	73	MD0	In/Out	Memory data0
24	VCLK	In	Video clock	74	nRD	In	CPU read signal
25	VSS	-	GND	75	nWR	In	CPU write signal
26	nHSYNC	In	HSYNC signal	76	ASTB	In	CPU latch signal
27	VDD	-	+5V	77	AD0	In/Out	CPU address/data0
28	nVSROZ	In	Engine Vsync request	78	AD1	In/Out	CPU address/data1
29	nCBSY	Out	Command busy signal	79	AD2	In/Out	CPU address/data2
30	nCCLK	Out	Communication clock	80	AD3	In/Out	CPU address/data3
31	nCMD	Out	Command data	81	AD4	In/Out	CPU address/data4
32	GIO3	Out	Print signal	82	AD5	In/Out	CPU address/data5
33	GIO4	In	Printer power ready signal	83	AD6	In/Out	CPU address/data6
34	GIO5	In	Printer ready signal	84	VDD	-	+5V
35	nSBSY	In	Status busy signal	85	AD7	In/Out	CPU address/data7
36	nSTS	In	Status data	86	nWAIT	In/Out	+5V (via 10k ohm)
37	MA0	Out	Memory address signal0	87	nINTR	Out	CPU interrupt signal
38	MA1	Out	Memory address signal1	88	nIOCS1	-	N.C.
39	MA2	Out	Memory address signal2	89	VSS	-	GND
40	VSS	-	-	90	CLKO	-	N.C.
41	MA3	Out	Memory address signal3	91	CLKI	In	System clock
42	MA4	Out	Memory address signal4	92	VSS	-	GND
43	VSS	-	-	93	nRESET	In	System reset signal
44	MA5	Out	Memory address signal5	94	CA8	In	CPU address8
45	MA6	Out	Memory address signal6	95	CA9	In	CPU address9
46	MA7	Out	Memory address signal7	96	CA10	In	CPU address10
47	VDD	-	-	97	SLCTIN	In	Select In signal
48	MA8	Out	Memory address signal8	98	nAUTOFD	In	Auto Feed signal
49	MA9	Out	Memory address signal9	99	nFAULT	Out	Fault signal
50	nINIT	In	Initial signal	100	SLCT	Out	Select signal

7.4.   IC5 (DRAM)

IC5 (DRAM)

Pin No.	Symbol	In/Out	Function	Pin No.	Symbol	In/Out	Function
1	VCC1	-	+5V	26	VSS1	-	GND
2	DQ1	In/Out	Data1	27	A4	In	Address4
3	DQ2	In/Out	Data2	28	A5	In	Address5
4	DQ3	In/Out	Data3	29	A6	In	Address6
5	DQ4	In/Out	Data4	30	A7	In	Address7
6	VCC2	-	+5V	31	A8	In	Address8
7	DQ5	In/Out	Data5	32	A9	In	Address9
8	DQ6	In/Out	Data6	33	nOE	In	Output enable signal
9	DQ7	In/Out	Data7	34	nUCAS	In	Upper column address strobe
10	DQ8	In/Out	Data8	35	nLCAS	In	Lower column address strobe
11	NC1	-	N.C.	36	NC9	-	N.C.
12	-	-	-	37	-	-	-
13	-	-	-	38	-	-	-
14	-	-	-	39	-	-	-
15	NC5	-	N.C.	40	NC13	-	N.C.
16	NC6	-	N.C.	41	DQ9	In/Out	Data9
17	nWE	In	Write enable signal	42	DQ10	In/Out	Data10
18	nRAS	In	Row address strobe	43	DQ11	In/Out	Data11
19	NC7	-	N.C.	44	DQ12	In/Out	Data12
20	NC8	-	N.C.	45	VSS2	-	GND
21	A0	In	Address0	46	DQ13	In/Out	Data13
22	A1	In	Address1	47	DQ14	In/Out	Data14
23	A2	In	Address2	48	DQ15	In/Out	Data15
24	A3	In	Address3	49	DQ16	In/Out	Data16
25	VCC3	-	+5V	50	VSS3	-	GND

7.5. IC6 (ASIC)

IC6 (ASIC)

Pin No.	Symbol	In/Out	Function	Pin No.	Symbol	In/Out	Function
1	VDD	-	+5V	51	VDD	-	+5V
2	CLKR	OUT	Crystal Connect (12MHz)	52	SM1A	OUT	Stepping Motor CH1 Phase A
3	CLKI	IN	Crystal Connect (12MHz)	53	SM1B	OUT	Stepping Motor CH1 Phase B
4	CLKOUT	OUT	12MHz Clock Output	54	nTRST	IN	GND
5	VSS	-	GND	55	SM0A	OUT	Stepping Motor CH0 Phase A
6	NRST	IN	System Reset	56	SM0NA	OUT	Stepping Motor CH0 Phase A
7	RSTO	OUT	Inverted System Reset	57	SM0B	OUT	Stepping Motor CH0 Phase B
8	nLED0	IN	Ready LED Control	58	SM0NB	OUT	Stepping Motor CH0 Phase B
9	nLED1	IN	Error LED Control	59	nCS	IN	Serial I/F Chip Select
10	nLED2	IN	Drum LED Control	60	SDI	IN	Serial Input Data
11	AI7	IN	USB Data 7	61	SDO	OUT	Serial Output Data
12	AI6	IN	USB Data 6	62	SCLK	IN	Serial Clock
13	AI5	IN	USB Data 5	63	nLEDO0	OUT	Ready LED Drive
14	AI4	IN	USB Data 4	64	nLEDO1	OUT	Error LED Drive
15	AI3	IN	USB Data 3	65	nLEDO2	OUT	Drum LED Drive
16	AI2	IN	USB Data 2	66	nBD	IN	Laser Beam Detect of LSU
17	AI1	IN	USB Data 1	67	nLDEN	OUT	Laser Enable
18	AI0	IN	USB Data 0	68	nADJUST	OUT	Laser Power Adjust
19	EO1	OUT	USB BUSY	69	nVIDEO	OUT	Video Data Output
20	CI0	IN	USB AUTOFD	70	nVD	IN	Video Data Input
21	CI1	IN	USB SLCTIN	71	nHSYNC	OUT	Hsync
22	CI2	IN	+5V	72	CDO3	OUT	INIT
23	CI3	IN	USB INIT	73	VSS	-	GND
24	EO2	OUT	USB PERR	74	PCNTCLK	IN	53.84MHz Clock
25	VDD	-	+5V	75	VDD	-	+5V
26	GND	-	GND	76	GND	-	GND
27	EO3	OUT	USB SELECT	77	ABO0	OUT	PC Interface Data 0
28	EO4	OUT	USB FAULT	78	ABO1	OUT	PC Interface Data 1
29	EO0	OUT	USB ACK	79	ABO2	OUT	PC Interface Data 2
30	SEL	IN	PC Interface Select USB/Centronics	80	ABO3	OUT	PC Interface Data 3
31	DI3	IN	Centronics INIT	81	ABO4	OUT	PC Interface Data 4
32	FO4	OUT	Centronics FAULT	82	ABO5	OUT	PC Interface Data 5
33	DI1	IN	Centronics SLCTIN	83	ABO6	OUT	PC Interface Data 6
34	DI2	IN	Centronics AUTOFD	84	ABO7	OUT	PC Interface Data 7
35	FO3	OUT	Centronics SELECT	85	CDO0	OUT	STB
36	FO2	OUT	Centronics PERR	86	EFI0	IN	ACK
37	FO1	OUT	Centronics BUSY	87	EFI1	IN	BUSY
38	FO0	OUT	Centronics ACK	88	EFI2	IN	PERR
39	BI7	IN	Centronics Data 7	89	EFI3	IN	SELECT
40	BI6	IN	Centronics Data 6	90	EFI4	IN	FAULT
41	BI5	IN	Centronics Data 5	91	CDO2	OUT	AUTOFD
42	BI4	IN	Centronics Data 4	92	CDO1	OUT	SLCTIN
43	BI3	IN	Centronics Data 3	93	VSS	-	GND
44	BI2	IN	Centronics Data 2	94	nRAS0	IN	RAS0 (Row Address Strobe 0)
45	BI1	IN	Centronics Data 1	95	nRAS1	IN	RAS1 (Row Address Strobe 1)
46	BI0	IN	Centronics Data 0	96	nCAS	IN	CAS (Column Address Strobe)
47	DI0	IN	Centronics STB	97	nRAS	OUT	RAS (Row Address Strobe)
48	LD5VSW	IN	Drum Unit Detect Switch Status	98	nLCAS	OUT	LCAS (Lower Column Address Strobe)
49	nSM1EN	OUT	Stepping Motor CH1 Enable	99	nUCAS	OUT	UCAS (Upper Column Address Strobe)
50	GND	-	GND	100	GND	-	GND

7.6. IC8 (USB Chip)

IC8 (USB Chip)

Pin No.	Symbol	In/Out	Function	Pin No.	Symbol	In/Out	Function
1	NC1	-	N.C.	21	NC3	-	N.C.
2	RESET	In	System Reset signal	22	NC4	-	N.C.
3	nSTROBE	Out	Strobe signal	23	X2	-	N.C.
4	BUSY	In	Busy signal	24	X1	In	System clock
5	D0	Out	Parallel data0	25	NC5	-	N.C.
6	D1	Out	Parallel data1	26	PLH	-	N.C.
7	D2	Out	Parallel data2	27	NC6	-	N.C.
8	D3	Out	Parallel data3	28	nACK	In	Acknowledge signal
9	VCC1	-	+5V	29	CS	-	(not used)
10	GND1	-	GND	30	SK	-	(not used)
11	D4	Out	Parallel data4	31	VCC3	-	+5V
12	D5	Out	Parallel data5	32	GND3	-	GND
13	D6	Out	Parallel data6	33	DI	-	(not used)
14	D7	Out	Parallel data7	34	DO	-	(not used)
15	VCP	Out	+3.3V output	35	nFAULT	In	Fault signal
16	D+	In/Out	USB differential data +	36	SELECT	In	Select signal
17	D-	In/Out	USB differential data -	37	PERR	In	Paper end signal
18	VCC2	-	+5V	38	nINT	Out	Initial signal
19	GND2	-	GND	39	nAUTOFD	Out	Auto Feed signal
20	NC2	-	N.C.	40	nSELECTIN	Out	Select In siganl

7.7. IC9 (Comparators)

IC9 (Comparators)

Pin No.	Symbol	In/Out	Function
1	A OUTPUT	Out	Comparator A Output
2	A -INPUT	In	Comparator A-Input
3	A +INPUT	In	Comparator A+Input
4	GND	-	GND
5	B+INPUT	In	Comparator B+Input
6	B -INPUT	In	Comparator B-Input
7	B OUTPUT	Out	Comparator B Output
8	VCC	-	+5V

7.8. IC10 (Reset IC)

IC10 (Reset IC)

Pin No.	Symbol	In/Out	Function
1	GND	-	GND
2	VDD	-	+5V
3	CD	-	Delay Capacitor
4	RESET	Out	Reset Signal

7.9. IC11 (Engine Control CPU)

IC11 (Engine Control CPU)

Pin No.	Symbol	In/Out	Function	Pin No.	Symbol	In/Out	Function
1	UI2	-	(not used)	33	P17	In	EEPROM data in
2	INT27	In	Door open signal	34	P16	-	(not used)
3	AN0	In	Thermistor voltage detect	35	P15	-	N.C.
4	P51	In	TESEN	36	P14	In	Resist seneor signal
5	P52	Out	Scanner motor control signal	37	P13	-	N.C.
6	P53	Out	Fan motor control signal	38	P12	-	N.C.
7	P54	Out	Toner Empty LED control signal	39	P11	In	EEPROM initialize signal
				40	P10	In	Exit sensor signal
8	P55	Out	Charger control signal	41	P07	Out	Pick up control signal
9	P56	Out	Dev. bias channel signal	42	P06	Out	Resist control signal
10	P57	Out	Transfer bias control signal	43	P05	Out	Exit control signal
11	AVCC	-	+5V	44	P04	Out	Motor I0 control signal
12	AVR	-	+5V	45	P03	-	N.C.
13	AVSS	-	GND	46	P02	Out	Purge signal
14	INT10	In	Hsync signal	47	P01	Out	Status busy signal
15	P61	In	Scanner motor lock signal	48	P00	Out	Top signal
16	INT12	In	Top sennsor signal	49	NC	-	GND
17	P63	In	Process unit detection signal	50	P30	Out	Printer ready signal
18	P64	In	Fan motor error signal	51	SCK1	In	Communication clock
19	nRST	In	System reset	52	SO1	Out	Status data signal
20	MOD0	-	GND	53	SI1	In	Command data signal
21	MOD1	-	GND	54	PTO2	Out	Dev. bias PWM signal
22	X0	In	System clock	55	P35	In	Print signal
23	X1	-	N.C.	56	VCC	-	+5V
24	VSS	-	GND	57	WTO	In	Command busy signal
25	P27	-	(not used)	58	PTO1	Out	Transfer bias PWM signal
26	P26	-	(not used)	59	INT20	In	Power save signal
27	P25	Out	EEPROM data out	60	P41	Out	Serial clock
28	P24	Out	EEPROM clock	61	P42	Out	Serial data out
29	P23	Out	EEPROM chip select	62	P43	In	Serial data in
30	PPGO2	Out	Scanner motor clock	63	P44	Out	Chip select
31	PPGO1	Out	Fuser contorl signal	64	P45	Out	Motor I1 control signal
32	P20	Out	+5V contorl signal				

7.10. IC12 (EEPROM)

IC12 (EEPROM)

Pin No.	Symbol	In/Out	Function
1	CS	In	Chip Select Signal
2	SK	In	Serial Clock
3	DI	In	Data Input
4	DO	Out	Data Output
5	GND	-	GND
6	TEST	-	Test terminal (not used)
7	NC	-	N.C.
8	VCC	-	+5 V

7.11. IC14 (Motor driver IC)

IC14 (Motor driver IC)

Pin No.	Symbol	In/Out	Function	Pin No.	Symbol	In/Out	Function
1	LG	-	GND	15	OUT3	Out	Phase signal (nB) output
2	VREF	-	+5V	16	NC3	-	N.C.
3	VSA	In	Voltage detector (A)	17	NC4	-	N.C.
4	I0	In	Output current ratio control signal	18	RSB	Out	Motor current output (B)
				19	OUT4	Out	Phase signal (B) output
5	IN2	In	Phase signal (nA) input	20	VMMB	-	+24V
6	IN1	In	Phase signal (A) input	21	VCC2	-	+5V
7	VCC1	-	+5V	22	IN4	In	Phase signal (B) input
8	VMMA	-	+24V	23	IN3	In	Phase signal (nB) input
9	OUT1	Out	Phase signal (A) output	24	I1	In	Output current ratio control signal
10	RSA	Out	Motor current output (A)				
11	OUT2	Out	Phase signal (nA) output	25	NC5	-	N.C.
12	NC1	-	N.C.	26	VSB	In	Voltage detector (B)
13	PG	-	GND	27	C/R	-	C,R connection for choping frequency
14	NC2	-	N.C.				

7.12. IC15 (Inverters)

IC15 (Inverters)

Pin No.	Symbol	In/Out	Function		
1	1A	In			
2	1Y	Out		A(In)	Y(Out)
3	2A	In		L	H
4	2Y	Out		H	L
5	3A	In			
6	3Y	Out			
7	GND	-	GND		
8	4Y	Out			
9	4A	In		A(In)	Y(Out)
10	5Y	Out		L	H
11	5A	In		H	L
12	6Y	Out			
13	6A	In			
14	VCC	-	+5V		

8 Preventative Maintenance

8.1. General

The preventative maintenance (PM) schedule is every 2,000 impressions. Adhering to this schedule will ensure maximum print quality and reduce machine downtime and service calls.

8.2. Recommended Tools

The following tools are recommended.

1. Toner vacuum cleaner

2. Blower brush

3. Cleaning alcohol

4. Cleaning cotton

5. Cotton swabs

8.3. Recommended Cleaning

1. Remove the OPC Drum Unit.

Caution :

When the OPC Drum Unit is removed, keep it covered to prevent light shock. Do not touch the black OPC drum surface.

2. Vacuum the inside of the machine after removing the OPC Drum Unit. Temporarily store the OPC Drum Unit in the protective bag.

3. Clean the rollers (feed roller, pickup roller) with alcohol.

Caution :

Do not use thinner or solvents; they will damage rubber and plastic components.

4. Clean the corona with a blower brush.

5. Clean the LSU cover glass with a dry lint-free cloth.

8.4. Maintenance Tables

8.4.1. User Maintenance

Replace these items according to the following schedule :

(x 1000 pages)

Item	Service												
	4	8	12	16	20	24	28	32	36	40	44	48	180
Toner Cartridge (KX-PDP7)	R	R	R	R	R	R	R	R	R	R	R	R	R
OPC Drum Unit (KX-PDM7)					R					R			

R: Replace

When print is faded or indicators show the following status, the replacement of a supply is needed.

Printer components	Indicators		Message of printer status display	Average life
	↯ ERROR	⬛/◉ TONER/DRUM UNIT		
Toner cartridge (KX-PDP7)	off	blinking	Low Toner Have or get a toner cartridge.	—
	blinking	on	Toner Empty Replace the toner cartridge.	4,000 pages [1],[2]
OPC Drum unit (KX-PDM7)	off	blinking	Change Drum Unit Have or get a drum unit.	—
	blinking	on	Drum Unit Worn out Replace the drum unit. Drum Unit Worn out and Toner Empty Replace the drum unit and toner cartridge.	20,000 pages

▭ : off   ⬛ : on   blinking (with an interval of 1 second)

[1] Refer to the next page.

[2] The toner cartridge provided with the printer is a starter kit toner cartridge, which has less toner. (The page life expectancy is 2,000 pages.)

8.4.2. Service Maintenance

8.4.2.1. Maintenance Cycle

The following table shows the service cycle of the main parts.

Item	Average Life	Service (x 1000 pages)					
		18	36	54	72	90	108
Fuser Unit	90,000 pages *1					R	
Transfer Roller	90,000 pages *1					R	
Retard Pad Assembly	90,000 pages					R	

R: Replace (Service Man Replaceable)

*[1] Average life is based on an average of 5% coverage of the printable area and standard density when the recommended media is used (refer to Example: 5% coverage). The life of a toner cartridge is varied dependingon the coverage, temperature, humidity or media etc. So the average life cannot be assured. Continuously printing 10% coverage of the printable area will reduce the life of the toner to about half as compared to printing 5% coverage.

Personal Image Editing System
Model No. XX-XXXX

Feature:
    Congratulations on your purchase of the XX-XXXX, the three-in-one solution to today's office
    needs. This amasing little desktop unit can be used as a : Printer, Scanner, Copier.

Printer Specification
    Printing Method: Semiconductor Laser Electro-Photography
    Print Speed: X ppm maximum (A4 size paper, text mode, 5 % image area)
    Resolution: 600 dpi X 600 dpi
    Paper Feed: 1 Multi-purpose manual feed up to 250 sheets of paper [75 g/m^2 (20 lbs.)]
    Paper Outout: Face-down paper ejection (up to 150 sheets) [75 g/m^2 (20 lbs.)]
    Software Emulation: GDI + Soft XXXX
    Paper Size/Weight: Letter, Legal, A4, Envelope, Executive, OHP, Label
    Memory Capacity: 2 MB
    Dimensions: 399 (W) X 390 (D) X 254 (H) mm (15.7" X 15.4" X 10")
    Mass {Weight}:   Approx. 10 Kg {22 lbs.}
    Consumables: Starter toner cartridge : 20,000 pages average
                            Toner cartridge: 4,000 pages average
                            Drum unit: 20,000 pages average
    Noise Level: Printing: 48 dBA
                            Stadby: 27 dBA
    CPU: Intel 80C51 compatible

Other Specification
    Operating Environment: 10 to 32.5°C [50 to 90.5°F]   20 to 80% RH
    Storing Environment: 0 to 35°C [32 to 95°F]   20 to 80% RH

Feature:
    Congratulations on your purchase of the XX-XXXX, the three-in-one solution to today's office
    needs. This amasing little desktop unit can be used as a : Printer, Scanner, Copier.

    ✻ Application Soft : Text Bridge, Card Scan

8.4.2.2. Lubrication

Lubricate the following parts when they are replaced or cleaned :

Part	Lubrication Point
Fuser Unit	Drive Gear, Intermediate Gear, Gear shaft
Main Chassis	Drive Gear, Gear Shaft

Refer to the part list for locations.

8.4.2.3. Recommended Lubrication

Lubricate the following parts when they are replaced or cleaned :

Part Number	Name	Main Part
PJOL-HP500	Grease	Drive Gear
GL-YM-103	Grease	OPC Gear / Fuser Gear
PJOL-GE676	Grease	Feed Roller
PJOL-948P	Oil	Roller Shaft

8.4.3. Counter Reset

You are able to reset the counter of the following items, when they are replaced.

Item	Counter Reset
OPC Drum Unit (KX-PDM7)	Press the **CONTINUE** button more than 20 seconds. (The error indicator will go off.)
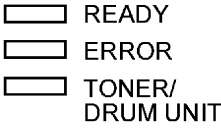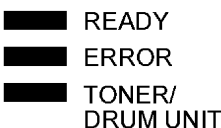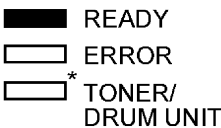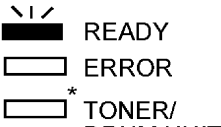
9 Troubleshooting

9.1. Self-Diagnostic Indicators

The printer indicates error conditions using the ON, OFF and blinking states of the Ready, Error and Toner/Drum unit LED indicators.

The printer status and error code are displayed on the printer status display on the host computer screen. The Status Display software must be installed on the computer.

9.1.1. Printer Status

LED Indicator	Printer Status Display	Possible Cause	Recovery
READY ERROR TONER/ DRUM UNIT	Power Off or Cable Problem or Printer Busy	The printer is off.	Turn the power on or check that cable is installed correctly.
		The printer cable is not installed correctly.	
		The cable is damaged.	
		While printing from other PC.	
READY ERROR TONER/ DRUM UNIT	Warming Up	Printer is warming up (three indicators light one after another).	No action.
READY ERROR *TONER/ DRUM UNIT	Ready	Printer is ready printing or in the sleep mode.	No action.
	Ready (Sleep)		
READY ERROR *TONER/ DRUM UNIT	Printing	Printer is receiving data printing.	No action.
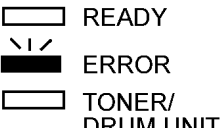
■ : on

▭ : off
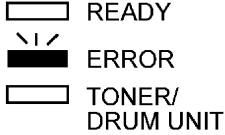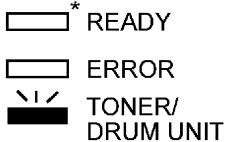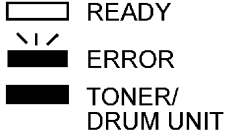
▨ : blinking fast (with an interval of 1 second).

* The status is varied depending on the condition.

9.1.2. Paper Jam

LED Indicator	Printer Status Display	Possible Cause	Recovery
READY ERROR TONER/ DRUM UNIT	Media Tray Empty or Miss feed	Media tray is empty or printer failed to feed media from media tray.	Load media in the media tray and press the **CONTINUE** button (less than 5 seconds).
	Manual Feed Empty	Media tray is empty	Load media in the manual feed.
	Jam at A, B, C, D, E	Media Jam has occurred.	Remove the jammed media, then open the front cover and close it. (See Section 9.5.)

9.1.3. User Error

LED Indicator	Printer Status Display	Possible Cause	Recovery
READY ERROR TONER/ DRUM UNIT	Front Cover Open	Front cover is open.	Close the front cover.
	Overrun	Overrun has occurred and cannot execute the current print job.	Press the **CONTINUE** button (less than 5 seconds) to delete the current print job.
	Memory Overflow	RAM overflow has occurred and cannot execute the current print job.	
*READY ERROR TONER/ DRUM UNIT	Low Toner	The toner is low.	Replace the toner cartridge soon.
	Change Drum Unit	DRUM Unit is wearing out.	Replace the drum unit soon, then press the **CONTINUE** button more than 20 seconds. (The error indicator will go off.)
READY ERROR TONER/ DRUM UNIT	Toner Empty	The toner is empty.	Replace the toner cartridge now.
	Drum Unit Missing	Drum unit is not installed.	Install the drum unit.
	Drum Unit Worn out	Drum unit is worn out.	Replace the drum unit now, then press the **CONTINUE** button more than 20 seconds. (The error indicator will go off.)
	Drum Unit Worn out and Toner Empty	Drum unit is worn out and toner is empty.	Replace the drum unit and the toner cartridge now. Then press the **CONTINUE** button more than 20 seconds. (The error indicator will go off.)

■ : on

☐ : off

≋ : blinking fast (with an interval of 1 second).

* The status is varied depending on the condition.

9.1.4. Call for Service

LED Indicator	Printer Status Display	Possible Cause	Recovery
☐ READY ■ ERROR ☐ TONER/ DRUM UNIT	Call for Service (Code : E20)	Scanner Motor is not rotating properly. Or HSYNC Signal is not detected.	See Section 9.6.1.
	Call for Service (Code : E30)	Fuser temperature is over correct range.	See Section 9.6.2.
	Call for Service (Code : E31)	1. Fuser temperature does not reach to 100°C within 30 sec., or it is less than 155°C during warm up. 2. Fuser temperature does not return to target temperature within 30 sec. after becoming lower than the target.	See Section 9.6.3.
	Call for Service (Code : E32)	Fuser thermistor is disconnected or open.	See Section 9.6.4.
	Call for Service (Code : E50)	Fan Motor is not rotating properly.	See Section 9.6.5.
	Call for Service (Code : E54)	Controller CPU program ROM checksum error occurred at power on.	See Section 9.6.6.
	Call for Service (Code : E71)	Read/Write error of EEPROM	See Section 9.6.7.
	Call for Service (Code : E73)	Parity error occurs or no response comes back from engine CPU.	See Section 9.6.8.
	Call for Service (Code : E81)	Controller RAM checksum error has occurred at power on.	See Section 9.6.9.

■ : on

☐ : off

9.2. Initial Troubleshooting Flowchart

```
                    ┌──────────────────┐
                    (      Start       )
                    └──────────────────┘
                              │
                              ▼
                         ╱─────────╲           ┌──────────────────────────┐
                        ╱  Does the  ╲    N     │ No Operation Section     │
                        ╲ printer work?╱──────▶ │ (Section 9.3)            │
                         ╲─────────╱            └──────────────────────────┘
                              │ Y
                              ▼
                         ╱─────────╲           ┌──────────────────────────┐
                        ╱ Is an error╲    Y     │ Error Code Section       │
                        ╲code displayed?───────▶ │ (Section 9.6)            │
                         ╲─────────╱            └──────────────────────────┘
                              │ N
                              ▼
                         ╱─────────╲           ┌──────────────────────────┐
                        ╱Is print quality╲ N   │ Print Quality Section    │
                        ╲   normal?    ╱──────▶ │ (Section 9.4)            │
                         ╲─────────╱            └──────────────────────────┘
                              │ Y
                              ▼
                         ╱─────────╲           ┌──────────────────────────┐
                        ╱Does paper feed╲ N    │ Paper Jam Section        │
                        ╲  normally?   ╱──────▶ │ (Section 9.5)            │
                         ╲─────────╱            └──────────────────────────┘
                              │ Y
                              ▼
                    ┌──────────────────┐
                    │       End        │
                    └──────────────────┘
```

9.3.　No Operation

```
┌─────────────────────┐
│    No Operation     │
└─────────────────────┘
```

Check resistance between +5V line/+24V line and GND. Are there any short circuit? — Y → Repair short circuited point.

N ↓

Are there any cables damaged or short circuit? — Y → Replace the cable.

N ↓

Is AC input voltage normal? — N → Supply normal voltage.

Y ↓

Are voltages (+24V, +5V) at the power supply unit (CN251) OK? (see Note) — N → Check or replace the power supply unit.

Y ↓

Are voltages (+24V, +5V) at the main control board (CN7) OK? — N → Check or replace the power supply cable.

Y ↓

Do indicator board cable's damage/disconnection and some error (Jam etc.) happen at the same time? — Y → Repair the damage /disconnection and error.

N ↓

Check or resolder IC1, IC3, IC6, IC11 and peripheral components.

↓

Does the error still remain? — Y → Replace IC1, IC3, IC6, IC11 or main control board.

N ↓

END

Note:
If cable between PSU (power supply unit) and main control board is disconnected, proper voltage will not come out from PSU.
If you check PSU only without the connection, connect 50Ω between +5V and GND (+5V). Proper voltage [approx +5V (approx 4.75V - approx 5.25V) and approx +24V (approx 21.6V - approx 27.6V)] will come out from PSU.

9.4. Print Quality

9.4.1. White Vertical Line in Print

```
      ┌─────────────────────┐
      │  White Vertical Line │
      │  in Print            │
      └─────────────────────┘
                │
                ▼
         ╱─────────────╲           N
        ╱  Is the toner  ╲──────────────┐
        ╲  cartridge      ╱             │
         ╲  normal?      ╱              ▼
          ╲─────────────╱     ┌──────────────────┐
                │ Y          │ Check or replace  │
                ▼            │ the toner cartridge.│
         ╱─────────────╲     └──────────────────┘
        ╱  Is the heat   ╲          N
        ╲  roller         ╱──────────────┐
         ╲  normal?      ╱               │
          ╲─────────────╱               ▼
                │ Y          ┌──────────────────┐
                ▼            │ Replace the      │
         ╱─────────────╲     │ heat roller.     │
        ╱  Is the laser  ╲   └──────────────────┘
        ╲  unit           ╱         N
         ╲  normal?      ╱──────────────┐
          ╲─────────────╱               │
                │ Y                     ▼
                ▼            ┌──────────────────┐
      ┌──────────────┐      │ Check or replace  │
      │ Check again. │      │ the laser unit.   │
      └──────────────┘      └──────────────────┘
```

Paper Travel

9.4.2. Blank Print

Paper Travel

```
      ┌─────────────────────┐
      │     Blank Print     │
      └─────────────────────┘
                 │
                 ▼
        ╱─────────────────╲         N      ┌──────────────────────┐
       ╱  Is the laser      ╲──────────────▶│ Check or replace the │
       ╲  unit normal?      ╱               │ laser unit.          │
        ╲─────────────────╱                 └──────────────────────┘
                 │ Y
                 ▼
        ╱─────────────────╲         N      ┌──────────────────────┐
       ╱  Is the toner      ╲──────────────▶│ Check or replace the │
       ╲  cartridge         ╱               │ toner cartridge.     │
        ╲  normal?         ╱                └──────────────────────┘
                 │ Y
                 ▼
        ╱─────────────────╲         N
       ╱  Is the OPC drum   ╲──────────────▶
       ╲  unit normal?      ╱
        ╲─────────────────╱
                 │ Y
                 ▼
```

Is the laser unit normal? → N → Check or replace the laser unit.

Is the toner cartridge normal? → N → Check or replace the toner cartridge.

Is the OPC drum unit normal? → N → * Check or replace the OPC drum unit.   * When replacing the OPC drum unit, reset the counter.   (see Section 8.4.3)

Is nVIDEO data line (components) (Pulse signal, L: Black, H: White) from CN3 (pin 3) to IC6 (pin 59) OK? → N → Resolder nVIDEO data line (components) from CN3 (pin 3) to IC6 (pin 59).
Or replace these components or main control board.

↓ Y

Check again.

9.4.3. Dark Vertical Line in Print

Dark Vertical Line in Print

P

Paper Travel

Are there scratches on the OPC drum surface?

Y → *Replace the OPC drum unit.

* When replacing the OPC drum unit, reset the counter. (see Section 8.4.3)

N

Is the OPC drum unit normal?

N → *Replace the OPC drum unit.

Y

Is the tungsten wire in the charge corona unit clean?

N → Clean the tungsten wire.

Y

Is the grid on the charge corona unit clean?

N → Clean the grid.

Y

Is the heat roller normal?

N → Replace the heat roller.

Y

Is the laser unit normal?

N → Replace the laser unit.

Y

Check again.

9.4.4. Dark Horizontal Line in Print

```
Dark Horizontal Line
in Print
        │
        ▼
Does the horizontal ──Y──►  * Replace the        * When replacing the OPC drum unit,
line appear every            OPC drum unit.          reset the counter.   (see Section 8.4.3)
    94mm?
        │N
        ▼
Is the toner cartridge ──N──►  Replace the
    normal?                    toner cartridge.
        │Y
        ▼
Is the laser unit ──N──►  Replace the
    normal?               laser unit.
        │Y
        ▼
Is the heat roller ──N──►  Replace the
    normal?                heat roller.
        │Y
        ▼
Is the transfer roller ──N──►  Replace the
    normal?                    transfer roller.
        │Y
        ▼
Is nHSYNC line ──N──►  Resolder nHSYNC line (components) from
(components) from CN3   CN3 (pin 6) to IC6 (pin 66). Or replace these
(pin 6) to IC6 (pin 66) components or main control board.
OK? (see Fig.1)
        │Y
        ▼
Check again.
```

Paper Travel

P

(Fig.1)

nHSYNC

+5V

0V

Min 0.5μs

498μs

9.4.5. Dirty Background

```
          ┌─────────────────────┐
          │   Dirty Background   │
          └─────────────────────┘
                     │
                     ▼
              Are the pinch
         roller and cleaning roller ──N──►  ┌────────────────────────┐
            on the front cover              │ Clean the pinch roller │
                 clean?                      │ and cleaning roller.   │
                     │Y                      └────────────────────────┘
                     ▼
                  Is the
                heat roller ──────N──►  ┌─────────────┐
                 clean?                 │ Clean the   │
                     │Y                 │ heat roller.│
                     ▼                  └─────────────┘
                  Is the
                Drum unit ────────N──►  ┌──────────────────┐
                 normal?                │ * Replace the OPC│
                     │Y                 │   Drum unit.     │
                     ▼                  └──────────────────┘
                  Is the
              toner cartridge ──N──►  ┌──────────────────┐
               normal life?           │ Replace the      │
                     │Y               │ toner cartridge. │
                     ▼                └──────────────────┘
                  Is the
              high voltage board ─N──►
                 normal?
                     │Y
                     ▼
          ┌──────────────────┐
          │   Check again.   │
          └──────────────────┘
```

* When replacing the OPC drum unit, reset the counter.   (see Section 8.4.3)

Check terminal springs/connector at the high voltage board. Or replace the high voltage board or terminal springs.

Paper Travel

9.4.6. All-black Print

(All-black Print)

Paper Travel →

Is the laser unit normal? — **N** → Replace the laser unit.

Y

Is the drum unit normal? — **N** → * Replace the drum unit.

* When replacing the OPC drum unit, reset the counter.   (see Section 8.4.3)

Y

Is the high voltage board normal? — **N** → Check connector or terminal springs at the high voltage board. Or replace the high voltage board or terminal springs.

Y

Is nVIDEO data line (components) (Pulse signal, L: Black, H: White) from CN3 (pin 13) to IC6 (pin 59). OK? — **N** → Resolder nVIDEO data line (components) from CN3 (pin 13) to IC6 (pin 59). Or replace these components or main control board.

Y

Check again.

9.4.7. Light Print

```
        ┌──────────────┐
        │  Light Print │
        └──────┬───────┘
               │
               ▼
```

◇ Are the drum unit and the toner cartridge properly installed? ──N──► Install the drum unit and the toner cartridge properly.

Y ▼

◇ Is the laser unit normal? ──N──► Clean the laser unit.

Y ▼

◇ Is the transfer roller properly installed? ──N──► Install the transfer roller properly.

Y ▼

◇ Is the high voltage board normal? ──N──► Check terminal springs or connector at the high voltage board. Or replace the high voltage board or terminal springs.

Y ▼

Check again.

Paper Travel

9.4.8. Ghosting

```
        ┌─────────────────┐
        │   * Ghosting    │        * Faded image is printed at a different position
        └─────────────────┘          from the original.
                 │
                 ▼
```

Is the media type setting of the printer driver correctly? — N → Set the media type setting correctly.

↓ Y

Is the transfer roller properly installed? — N → Install the transfer roller properly.

↓ Y

Is the operating environment (temperature/moisture) normal? — N → Set the operating environment normally. Use the new paper.

↓ Y

Is the print density normal? — N → Set the Density of the Printer Console lighter.

↓ Y

Check again.

9.4.9. Black or White Dots

```
┌─────────────────────┐
│  Black or White Dots │
└─────────────────────┘
```

Do the white or black dots repeatedly? — N → Do the black thin spots appear on halftone printing? — Y → Clean the surface of the OPC drum.

Do the white or black dots repeatedly? — Y → Measure the spacing between the spots.

Do the black thin spots appear on halftone printing? — N → Do the white spots appear on halftone or fill printing? — Y → Clean the surface of the OPC drum.

Do the white spots appear on halftone or fill printing? — N → Check again.

Space	Remedy
94 mm	Wipe paste/glue away from the OPC drum with a dry cotton swab or dry soft cloth.
78 mm	Clean the surface of heat roller or replace the fuser unit.
35 mm	Replace the toner cartridge.

9.4.10. Toner Spatter

Toner Spatter — Small toner spots on halftone or parallel lines printing.

```
         ┌─────────────────┐
         │ * Toner Spatter │        * Small toner spots on halftone or parallel lines printing.
         └────────┬────────┘
                  │
                  ▼
            Is the
        media type setting      N      ┌──────────────────────────────────┐
        in the printer driver ─────────▶│ Set the media type setting correctly. │
            correct?                    └──────────────────────────────────┘
                  │ Y
                  ▼
            Is the
        operating environment   N      ┌──────────────────────────────────┐
        (temperature/moisture) ────────▶│ Change the operating environment, │
            normal?                     │ or use new paper.                 │
                  │ Y                   └──────────────────────────────────┘
                  ▼
            Is the
        discharge sheet of      N      ┌──────────────────────────────────┐
        the transfer roller ──────────▶│ Clean the discharge sheet.        │
            clean?                      └──────────────────────────────────┘
                  │ Y
                  ▼
            Is the
        high voltage board      N      ┌──────────────────────────────────┐
            normal?         ──────────▶│ Replace the high voltage board.   │
                  │ Y                   └──────────────────────────────────┘
                  ▼
        ┌─────────────────┐
        │ Check again.    │
        └─────────────────┘
```

9.5. Paper Jam

9.5.1. Media Tray Empty or Misfeed

PC Message	Possible Cause
Media Tray Emp or Misfeed	The registration sensor did not sense print media.

```
                    Is the media tray          Y
                        empty?          ─────────→   Load the print media.
                          │
                          │ N
                          ▼
                    Is the print media
                  folded, cornered or curled?     N
                  Is the print media being used ─────→   Replace the print media.
                    within specification?
                          │
                          │ Y
                          ▼
                    Are the media side
                guides and size knob positioned   N     Set the media side guides or size knob
                        correctly?        ─────────→    correctly.
                          │
                          │ Y
                          ▼
                                                        Replace the print media to obtain
                    Is the print media       N          smooth vertical movement.
                    loaded normal?    ─────────────→    Check or correct the movement of
                                                        the media lifter.
                          │
                          │ Y
                          ▼
                    Is the pickup roller      N
                        clean?        ─────────────→    Clean the pickup roller.
                          │
                          │ Y
                          ▼
                    Does the pickup           N         Check or replace the pickup solenoid,
                    solenoid work     ─────────────→    CN12, Q23, Q20 or IC11.
                      properly?
                          │
                          │ Y
                          ▼
                    Are the gears             N
                    normal?           ─────────────→    Replace the worn or broken gear.
                          │
                          │ Y
                          ▼
                    Check again.
```

9.5.2. Jam at A

PC Message	Possible Cause
Jam at A	The paper exit/ADU sensor did not sense print media.

Is the print media folded, cornered or curled? Is the print media being used within specification? — **N** → Replace the print media.

Y

Is the paper transport mechanism normal? — **N** → Clean and check the roller and spring.

Y

Is the registration solenoid worked properly? — **N** → Check or replace the solenoid, CN13, Q24, Q21 or IC11.

Y

Is the registration roller normal? — **N** → Clean or replace the roller.

Y

Is the registration pinch roller normal? — **N** → Clean or replace the pinch roller.

Y

Are the registration pinch roller springs normal? — **N** → Check or replace the pinch roller springs.

Y

Is the registration sensor normal? — **N** → Check or replace the registration sensor or the registration & paper top sensor board.

Y

Is the paper top sensor normal? — **N** → Check or replace the paper top sensor or the registration & paper top sensor board.

Y

Check or replace the registration & paper top sensor board, CN15, CN16, IC11 or main control board.

9.5.3. Jam at B

PC Message	Possible Cause
Jam at B	Print media remains on the paper exit sensor too long.

Is the print media folded, cornered or curled? Is the print media being used within specification? — **N** → Replace the print media.

↓ **Y**

Does the paper exit sensor arm operate properly? — **N** → Correct movement of the sensor arm.

↓ **Y**

Does the lower exit roller rotate? — **N** → Check the gears train to the fuser unit.

↓ **Y**

Are the cables and connectors for paper exit sensor board and main control board normal? — **N** → Check or replace the paper exit sensor board, cable, CN16 or IC11.

↓ **Y**

Does the pickup solenoid work properly? — **N** → Check or replace the pickup solenoid, CN12, Q23, Q20 or IC11.

↓ **Y**

Replace the main control board.

↓

Does the trouble still occur? — **N** → END

↓ **Y**

Replace the fuser unit.

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9.5.4. Jam at C

PC Message	Possible Cause
Jam at C	The registration sensor did not sense print media on the Auto Duplex printing.

Is the print media folded, cornered or curled? Is the print media being used within specification? → **N** → Replace the print media.

↓ Y

Does the lower exit roller rotate? → **N** → Check the gears train to the fuser unit.

↓ Y

Are there the foreign obstructions in duplex paper path? → **N** → Remove the foreign obstructions.

↓ Y

Does the ADU paper feed roller rotate? → **N** → Check the gears train to the ADU.

↓ Y

Replace the ADU (Auto Duplex Unit).

9.5.5. Jam at D, E

PC Message	Possible Cause
Jam at D	The ADU paper jam sensor did not sense print media on the Auto Duplex printing.
Jam at E	Print media remains on the ADU paper jam sensor too long on the Auto Duplex printing.

Is the print media folded, cornered or curled? Is the print media being used within specification? — N → Replace the print media.

Y

Are the fuser gear normal? — N → Replace the fuser gear.

Y

Does the ADU paper jam sensor arm operate properly? — N → Correct movement of the sensor arm.

Y

Does the upper and lower exit rollers rotate? — N → Check the gears train to the fuser unit.

Y

Does the switchback solenoid work properly? — N → Check or replace the solenoid, CN14, Q25, Q22 or IC11.

Y

Are there the foreign obstructions in duplex paper path? — N → Remove the foreign obstructions.

Y

Does the ADU paper feed roller rotate? — N → Check the gears train to the ADU.

Y

Are the cables and connectors for ADU paper jam sensor board and main control board normal? — N → Check or replace the ADU paper jam sensor board, cable, CN16 or IC11.

Y

Replace the main control board.

Does the trouble still occur? — N → END

Y

Replace the fuser unit.

9.6. Call Service

9.6.1. E20

PC Message	Possible Cause
Call for Service (Code : E20)	Scanner motor speed is not locked within 5 seconds after scanner motor starts. Or HSYNC Signal is not detected.

Is the laser unit normal? — N → Check or replace the laser unit.

↓ Y

Is the connection of the scanner cables are normal? — N → Check or replace the scanner cables.

↓ Y

Is the voltage at pin 5 of CN11 OK? (see Fig 1) — N → Go to "No Operation Section".

↓ Y

Is the voltage at pin 4 of CN11 OK? — Different Voltage → Find out and repair the short circuited position.

↓ 0V

* Is the waveform at pin 3 of CN11 OK? (see Fig 2) — N → Is the waveform at pin 5 of IC11 OK? (see Fig 5) — N → Check or replace IC11.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　↓ Y → Check or replace Q8.

↓ Y

* Is the waveform at pin 2 of CN11 OK? (see Fig 4) — N → Check or replace CN11, cable or LSU.

↓ Y

* Is the waveform at pin 1 of CN11 OK? (see Fig 3) — N → Is the waveform at pin 30 of IC11 OK? (see Fig 6) — N → Check or replace IC11.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　↓ Y → Check or replace Q9.

↓ Y

* Is the waveform at pin 5 (see Fig 5), pin 30 (see Fig 6) of IC11 OK? — N → Check or replace IC11.

↓ Y

Is nHSYNC line (components) between CN3 and IC6 OK? (see Fig 7) — N → Resolder or replace these components. → Check again.

↓ Y

* Keep checking pin more than 20 sec after turning the power on.

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(Fig.1) +24V
(pin 5 of CN11)
+24V
0V

(Fig.2) nSNRCTL
(pin 3 of CN11)
5V
0V

approx 0.5ms

(Fig.3) nSNRCLK
(pin 1 of CN11)
5V
0V

≤5sec

≤0.5ms   ≤0.5sec

(Fig.4) nSNRLD
(pin 2 of CN11)
5V
Don't care

(Fig.5) SNRCTL
(pin 5 of IC11)
5V
0V

approx 0.5ms

(Fig.6) SNRCLK
(pin 30 of IC11)
5V
0V

(Fig.7) nHSYNC
5V
0V
Min 0.5μs
498μs

9.6.2. E30

PC Message	Possible Cause
Call for Service (Code : E30)	Fuser temperature is over 215°C. (Fuser over heat had happened.)

Is the thermistor or connection to the main board proper? — N → Check or replace the thermistor or connector.

↓ Y

Remove left side cabinet.

Is the fuser lamp ON/OFF operation proper? — N →

↓ Y

Does E32 (thermistor open error) happen when thermistor is disconnected? — Y → Check or replace the thermistor.

↓ N

Is voltage between R64 and R65 approx 0.22V when thermistor is disconnected? — Y → Check or replace R70/IC11.

↓ N

Check or replace R64, R65.

Turn the power switch off. Remove AC power cord.

Is thermostat inside fuser unit approx 0Ω? — N → Check or replace the thermostat.

↓ Y

Is thermal fuse inside the fuser unit approx 0Ω? — N → Check or replace the thermal fuse.

↓ Y

Are mechanical parts/cables inside the fuser unit OK? — N → Check or replace the damaged parts.

↓ Y

Install AC power cord. Turn the power switch on.

Is the supply voltage for the fuser unit correct? — N → Check or replace the low voltage power supply unit.

↓ Y

Does the voltage at pin1 of CN7 change 5V → 0V/ 0V → 5V several times? (see Note) — N →

↓ Y

Does the voltage at pin1 of CN251 change 5V → 0V/ 0V → 5V several times? (see Note) — N → Check or replace cable between the power supply unit and the main control board.

↓ Y

Check or replace the power supply unit.

Does the voltage at collector of Q7 change 0V → approx 3.2V/ approx 3.2V → 0V several times? (see Note) — Y → Check or replace Q4.

↓ N

Does the voltage at pin 31 of IC11 change 5 V → 0V/ 0V → 5V several times? (see Note) — Y → Check or replace Q7, R74, R75, R76, R78, R81 or R82.

↓ N

Check or replace IC11, R84.

Note:
Check pin or connector several minutes. If the fuser lamp is turned on continuously more than approx 30 sec, the fuser unit will become too hot. Some parts inside the unit may be damaged. Turn the power switch off, in this case. Be careful.

9.6.3.　E31

PC Message	Possible Cause
Call for Service (Code : E31)	• Fuser temperature does not reach 100°C within 30 sec, or it is less than 155°C during warm up. • Fuser temperature does not return to target temperature within 30 sec after becoming lower than the target.

Remove the left side cabinet.

Is the fuser lamp ON/OFF operation proper? —N→ Turn the power switch off. Remove AC power cord. → Is the fuser lamp or thermostat open? —Y→ Replace the fuser lamp or thermostat.

Is the fuser lamp ON/OFF operation proper? —Y↓

Does the thermistor touch the heat roller correctly? —N→ Set the thermistor correctly.

Is the fuser lamp or thermostat open? —N↓

Is the thermal fuse open? —Y→ Replace the thermal fuse.

Does the thermistor touch the heat roller correctly? —Y↓

Is the thermistor or connection to the main board proper? —N→ Check or replace the thermistor or check thermistor connection to the main control board.

Is the thermal fuse open? —N↓

Install AC power cord. Turn the power switch on.

Is the thermistor or connection to the main board proper? —Y↓

Does E32 happen when thermistor is disconnected? —Y→ Check or replace the thermistor.

Is the supply voltage for fuser correct? —N→ Check or replace the low voltage power supply unit or cable for fuser lamp.

Does E32 happen when thermistor is disconnected? —N↓

Is voltage between R64 and R65 approx 0.22V when thermistor is disconnected? —Y→ Check or replace R70, IC11.

Is voltage between R64 and R65 approx 0.22V when thermistor is disconnected? —N→ Check or replace R64, R65.

Is the supply voltage for fuser correct? —Y↓

Does the voltage at pin1 of CN7 change 5V → 0V/ 0V → 5V several times? (see Note) —N→ Does the voltage at collector of Q7 change 0V → approx 3.2V/ approx 3.2V → 0V several times? (see Note) —Y→ Check or replace Q4.

Does the voltage at pin1 of CN7 change 5V → 0V/ 0V → 5V several times? (see Note) —Y↓

Does the voltage at collector of Q7 change 0V → approx 3.2V/ approx 3.2V → 0V several times? (see Note) —N↓

Does the voltage at pin1 of CN251 change 5V → 0V/ 0V → 5V several times? (see Note) —N→ (to Check or replace cable...)

Does the voltage at pin 31 of IC11 change 5 V → 0V/ 0V → 5V several times? (see Note) —Y→ Check or replace Q7, R74, R75, R76, R78, R81 or R82.

Does the voltage at pin 31 of IC11 change 5 V → 0V/ 0V → 5V several times? (see Note) —N→ Check or replace IC11, R84.

Does the voltage at pin1 of CN251 change 5V → 0V/ 0V → 5V several times? (see Note) —Y→ Check or replace the power supply unit.

Check or replace cable between the power supply unit and the main control board.
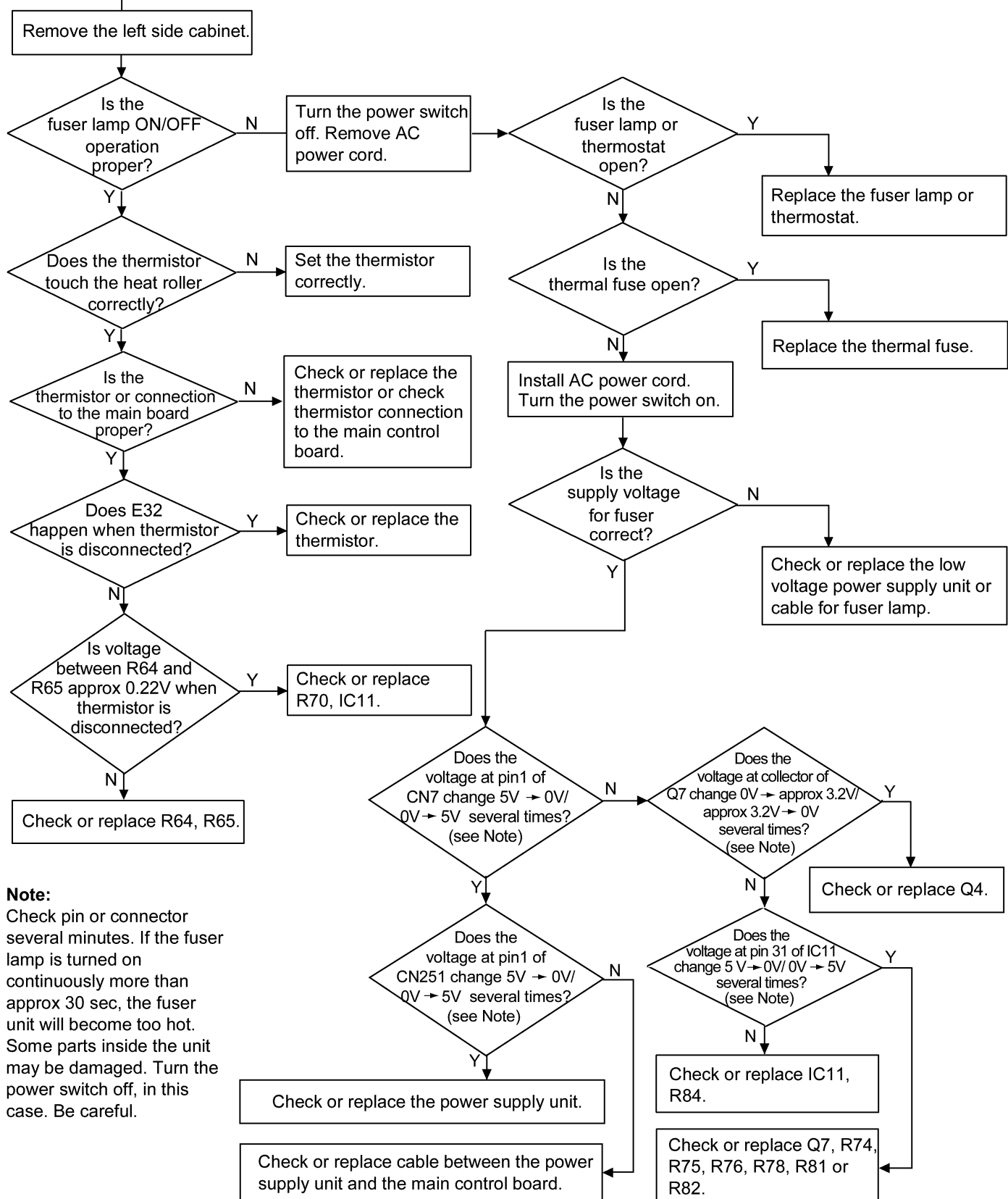
Note:
Check pin or connector several minutes. If the fuser lamp is turned on continuously more than approx 30 sec, the fuser unit will become too hot. Some parts inside the unit may be damaged. Turn the power switch off, in this case. Be careful.
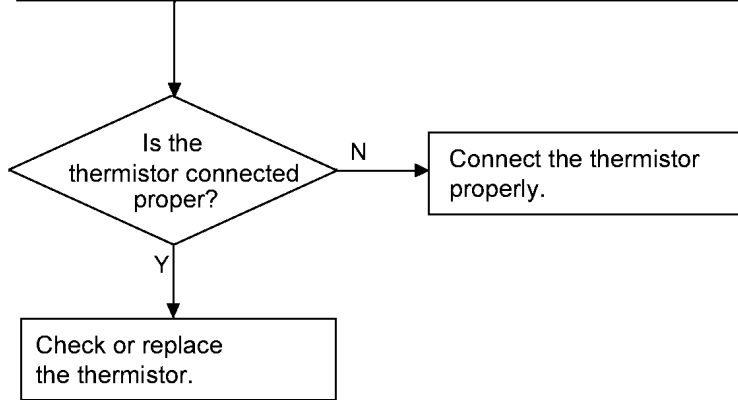
9.6.4.   E32

PC Message	Possible Cause
Call for Service (Code : E32)	Fuser thermistor is disconnected or open.

```
        Is the
   thermistor connected   ──N──►   Connect the thermistor
        proper?                    properly.
           │
           Y
           │
           ▼
   Check or replace
   the thermistor.
```

9.6.5.   E50

PC Message	Possible Cause
Call for Service (Code : E50)	Fan motor is not rotating properly.

Is the fan rotating when power switch is turned on. → N → **Is the fan connector attached properly?** → N → Connect correctly.

Y (down)

↓ Y → **Is the +24V supplied to the fan when the power switch is turned on?** → Y → Replace the fan motor.

Is supplied voltage 24V in warm up/ printing, approx 16V in reduced power mode ? → N →

N ↓

Is the signal at pin 6 of IC11 OK? (see Fig.1) → N → Check or replace IC11.

Y ↓

Is the signal at pin 7 of IC9 OK? (see Fig.1) → N → Check or replace IC9, R177, R178, R180, R181, R182, R183, C175, C181.

Y ↓

Check or replace Q15, Q17, their connected components.

(Left branch) Y ↓

When one lead wire for FAN error signal is removed from connector, is voltage at the lead wire's terminal 0V? → N → Check or replace fan motor.

Y ↓

Is voltage at pin 18 of IC11 0V? → N → Check or replace CN19, R119, R120, IC11.

Y ↓

Is the fan motor error still remain? → N → **END**

Y ↓

Replace the fan motor.

Fig. 1

Pin	Mode	Correct signal
Pin 6 of IC11	Warm up/ Printing	High
	Reduced power	5V / 0V approx 0.5ms (pulse signal)
Pin 7 of IC9	Warm up/ Printing	High
	Reduced power	Pulse signal

9.6.6.　E54

PC Message	Possible Cause
Call for Service (Code : E54)	Controller CPU program ROM checksum error has occurred.

Replace the controller CPU (IC1) or the main control board.
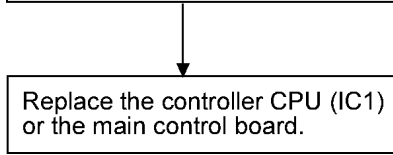
9.6.7.　E71

PC Message	Possible Cause
Call for Service (Code : E71)	EE-PROM Read/Write error has occurred.

Are data signals and control signals OK?

N → Check or repair soldering condition on IC11, IC12.

Y

Does the error still remain?

N → **END**

Y

Replace the IC12 EE-PROM or the main control board.

9.6.8. E73

PC Message	Possible Cause
Call for Service (Code : E73)	Parity error occurs or no response comes back from the engine CPU.

```
Are signals (nCBSY,          N      Check or repair soldering
nSBSY, CXD, SXD,  ──────────────▶   condition along the signal
CCLK) OK ?                           lines, IC3, IC11.

   │ Y
   ▼

Does the error still         N
remain?           ──────────────▶   END

   │ Y
   ▼

Replace the engine CPU(IC11),
IC3 or the main control board.
```

9.6.9. E81

PC Message	Possible Cause
Call for Service (Code : E81)	Controller RAM checksum error has occurred.

```
Check or replace the controller
CPU (IC1), IC4 or the main
control board.
```

10 Replacement Parts List with Lubrication Guide

Notes:

1. Important safety notice.
   Components identified by ⚠ have special characteristics important for safety.
   When replacing any of these components, use only manufacturer's specified parts.
2. The S mark is for service standard parts and may differ from production parts.
3. The marking (RTL) indicates that the Retention Time is limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependent on the type of assembly and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.

10.1. Exterior

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▲ GL-YM-103
☆ PJOL-948P
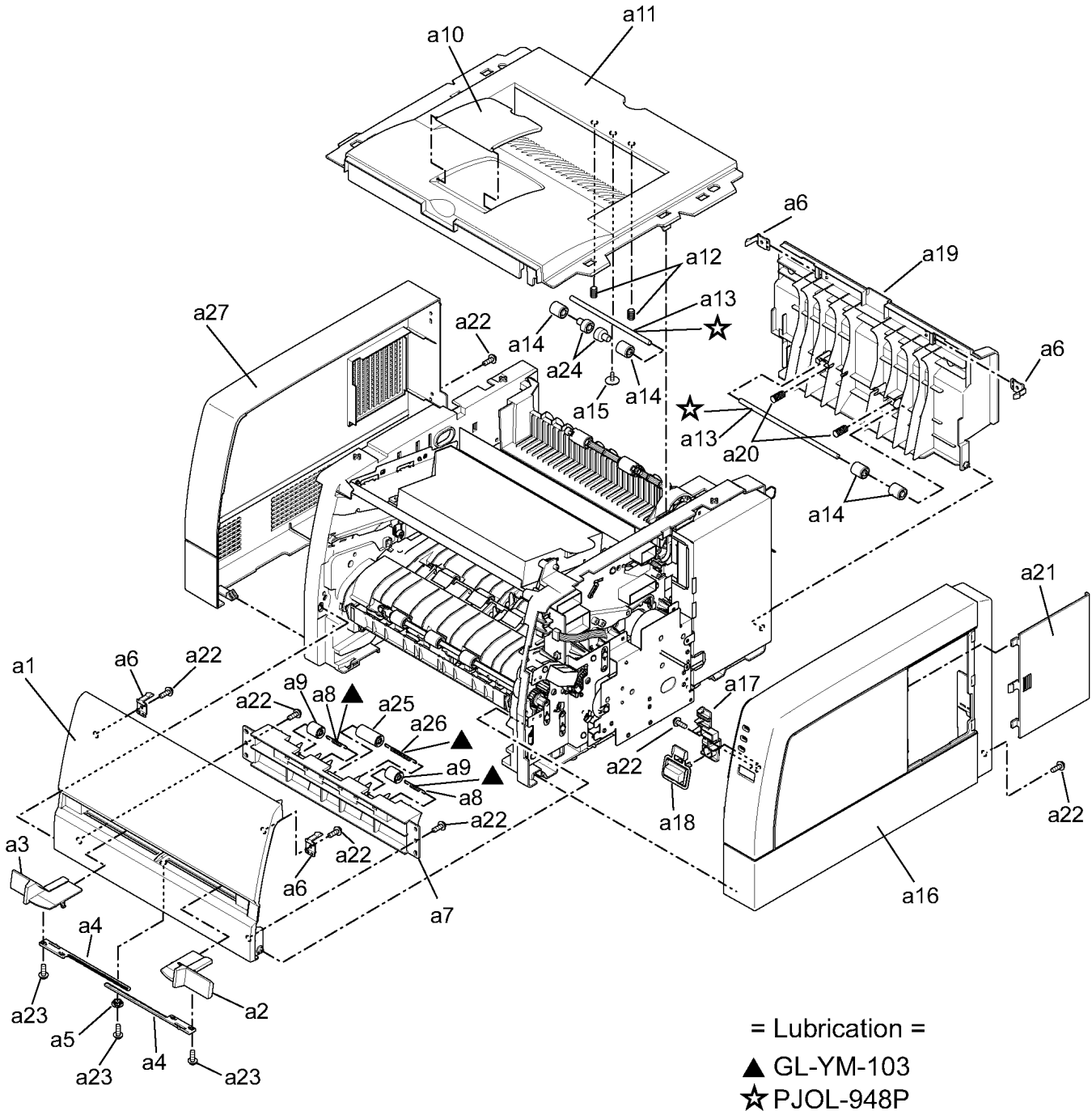
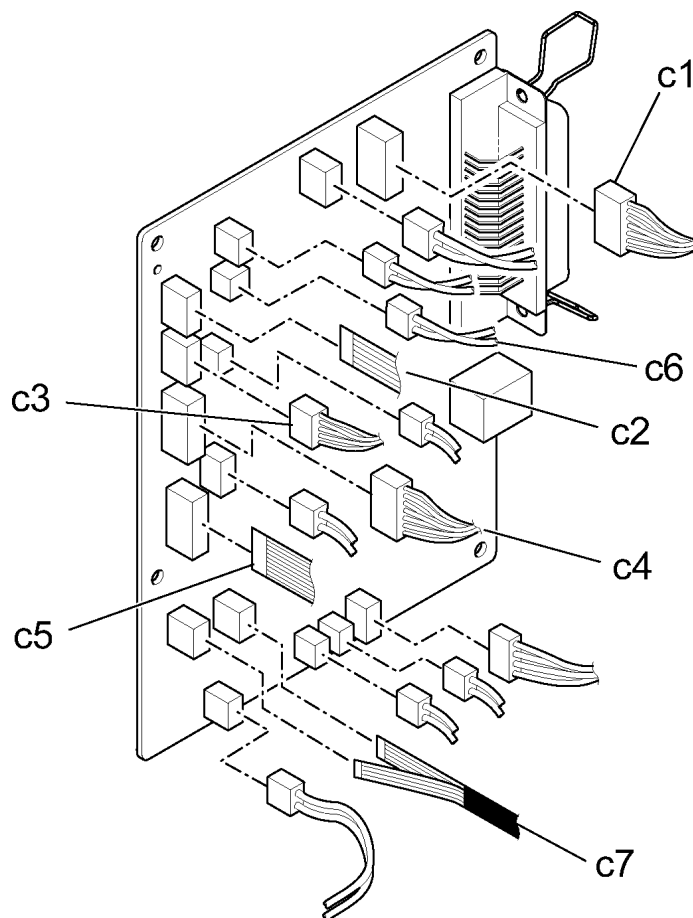| Ref. No.	Part No.	Part Name & Description
a1	PJYK2P7100M	Front Cover Assembly
a2	PJHRB0043Z	Paper Guide (R)
a3	PJHRB0044Z	Paper Guide (L)
a4	PJHRB0045Z	Guide Rack
a5	PJHRB0046Z	Paper Guide Pinion Gear
a6	PJBAB0011Z	Hook
a7	PJYKP7100M	Pinch Roller Holder Assembly
a8	PJDSB0034Z	Pinch Roller Spring
a9	PJDRB0017Z	Pinch Roller
a10	PJKEB0012Z	Paper Support
a11	PJYFP7100M	Top Cover Assembly
a12	PJDSB0019Z	Spring
a13	PJDFB0008Z	Roller Shaft
a14	PJDRB0017Z	Roller
a15	PJHE5065Z	Screw
a16	PJYK3P7100M	Right Cover
a17	PJBAB0008Z	LED Indicator Cover
a18	PJBCB0002Z	Continue Button
a19	PJKEB0010Z	Rear Cover
a20	PJDSB0112Z	Spring
a21	PJKEB0013Z	Option Cover
a22	XTW3+8S	Screw 3 x 8 mm
a23	XTW26+8S	Screw 2.6 x 8 mm
a24	PJDRB0059Z	SUB Roller
a25	PJDRB0066Z	Cleaning Roller
a26	PJDSB0145Z	Cleaning Roller Spring
a27	PJYK1P7100M	Left Cover Assembly

10.2. Right Side Parts

See section 7.2.1
"Main Controller Board Connector".

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★ PJOL-GE676
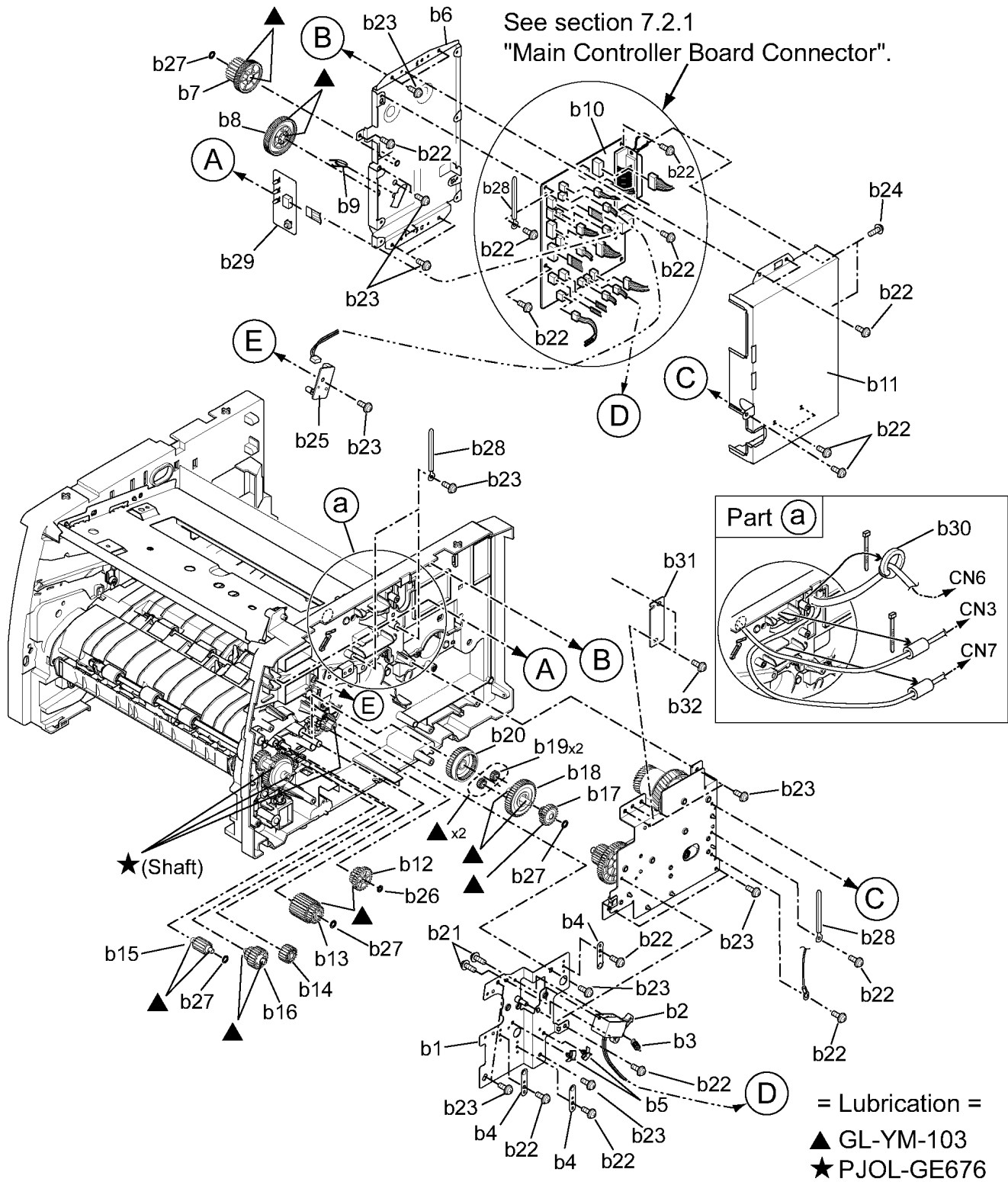
Ref. No.	Part No.	Part Name & Description	Remarks
b1	PJZC2P7100M	Gear Support Bracket	
b2	PJWMP7100M	Registration Solenoid Assembly	
b3	PJDSB0038Z	Registration Lever Spring	
b4	PJUSB0025Z	Earth Spring	
b5	PJHRB0327Z	Clamp	
b6	PJZH1P7100M	Fuser Drive Gear Bracket	
b7	PJDGB0051Z	Fuser Drive Gear	
b8	PJDGB0050Z	Fuser Intermediate Gear	
b9	PJDSB0039Z	Gear Tension Spring	
b10	PJWPP7100M	Main Control Board Complete	RTL
b11	PJMCB0006Z	Main Board Shield Cover	

Ref. No.	Part No.	Part Name & Description	Remarks
b12	PJDGB0052Z	ADU Drive Gear	
b13	PJDGB0070Z	Registration Drive Gear	
b14	PJDGB0072Z	Idle Gear Z19	
b15	PJDGB0071Z	Double Teeth Gear	
b16	PJDGB0073Z	Idle Gear Z14	
b17	PJDGB0028Z	Ratchet Gear	
b18	PJDGB0043Z	Registration Arm Gear	
b19	PJDGB0029Z	Planetary Gear Z18	
b20	PJDGB0042Z	Registration Internal Gear	
b21	XYN3+F5	Screw 3 x 5 mm	
b22	XTW3+6L	Screw 3 x 6 mm	
b23	XTW3+8S	Screw 3 x 8 mm	
b24	XSN3+6	Screw 3 x 6 mm	
b25	PJWP3P7100M	Toner Empty Sensor Board Complete	RTL
b26	PJNW4111Z	Plastic Ring	
b27	PJNW525Z	Plastic Ring	
b28	PJMDB0156Z	Clamp	
b29	PJWP4P7100M	Indicator Board	RTL
b30	K5AT281613	Core	
b31	PJWP5P7100M	Relay Board (A) Complete	RTL
b32	XYC3+FF8C	Screw 3 x 8 mm	

10.2.1. Main Controller Board Connector

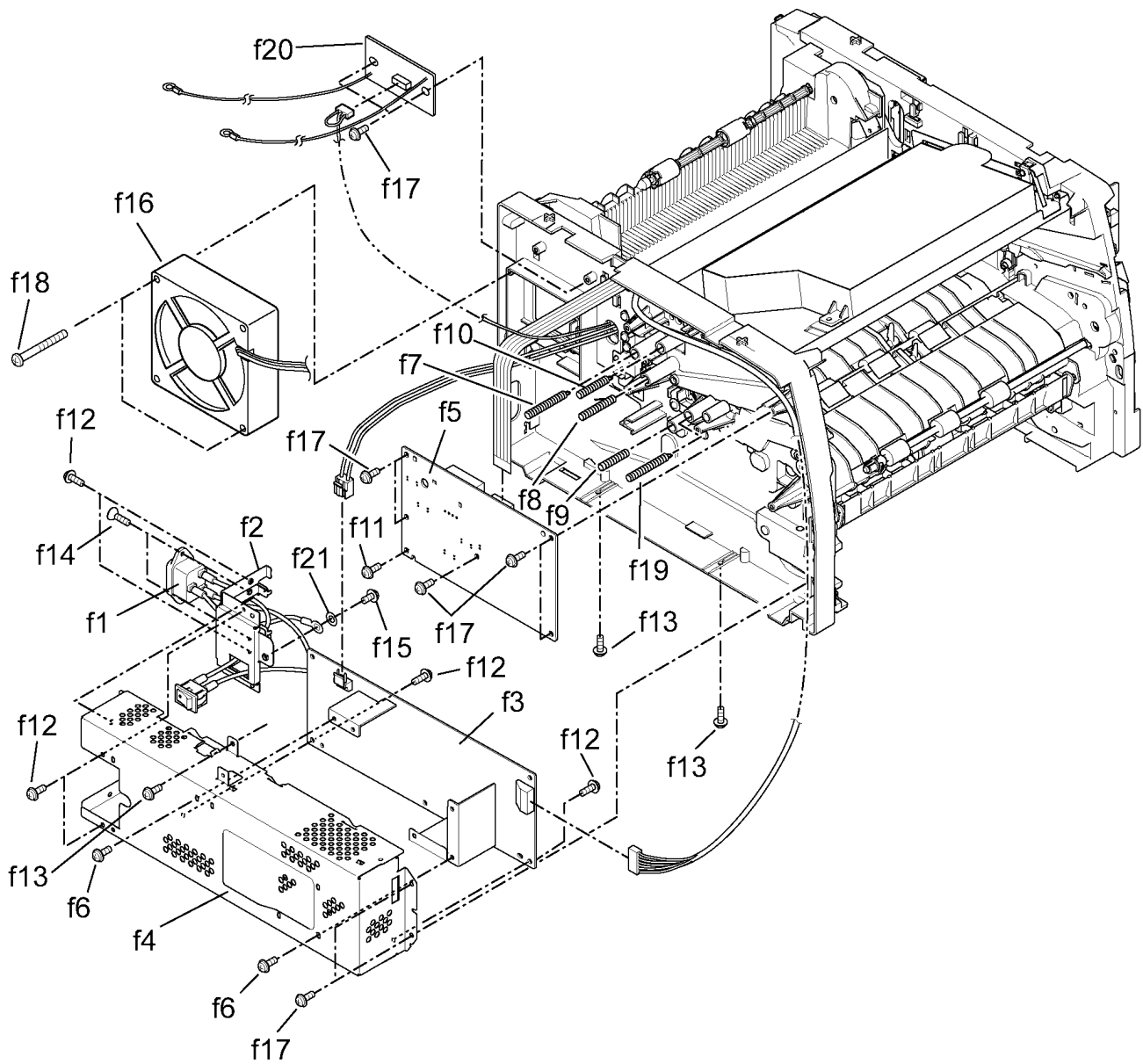| Ref. No.	Part No.	Part Name & Description
c1	PJJRML0005Y	Cable (from LSU)
c2	PJJEC06002Z	Flat Cable (from Indicator Board)
c3	PJJRML0006Z	Cable (from Polygon Motor)
c4	PJJRML0001Y	Cable (from Power Supply Unit)
c5	PJWWP7100M	Flat Cable (from High Voltage Board)
c6	PJJRML0011Z	Cable (from Toner Empty Sensor Board)
c7	PJWW1P7100M	Flat Cable (from Reg/Top Sensor and Exit Sensor Board)

10.2.2. Pickup Roller and Paper Feed Roller

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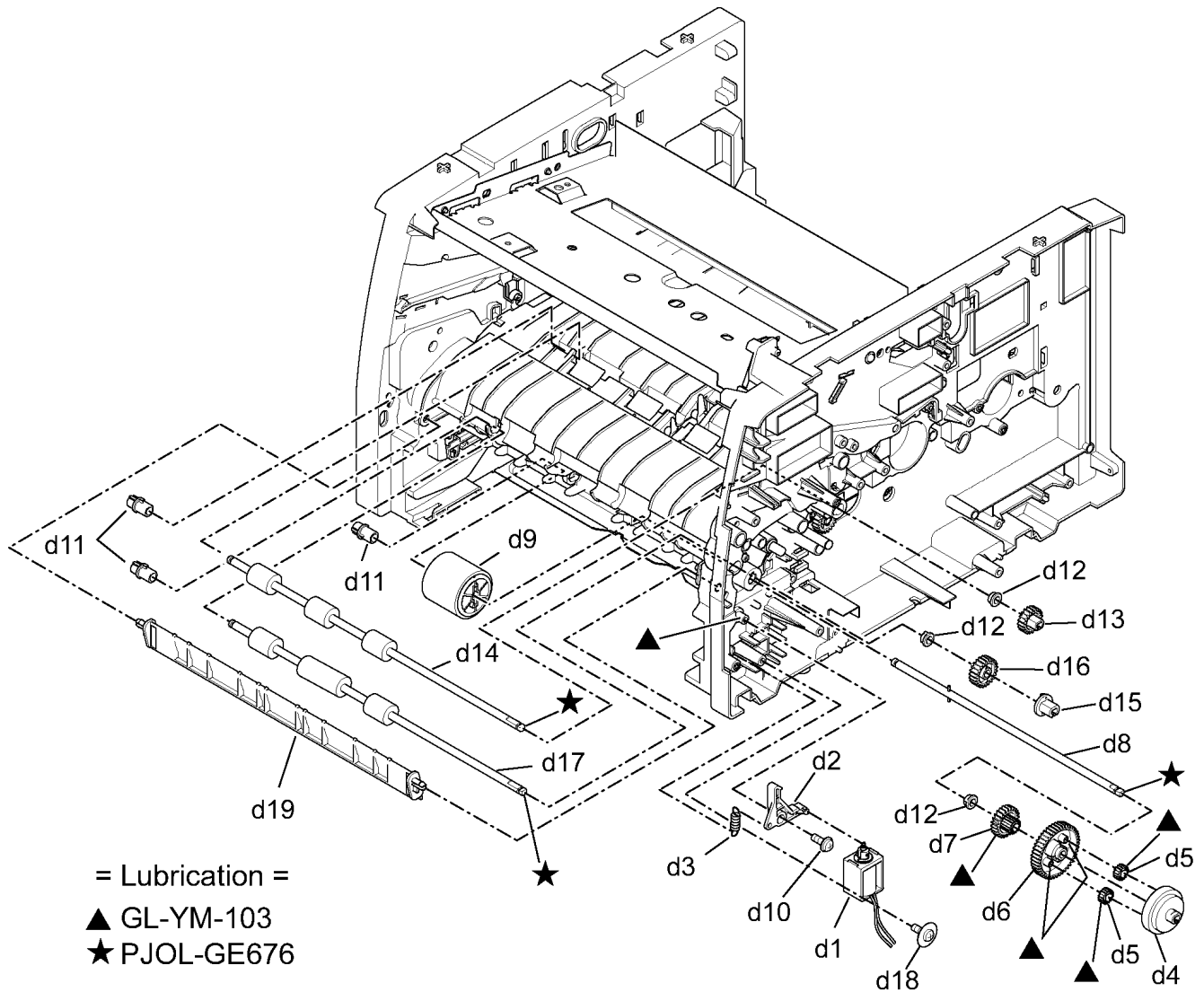
Ref. No.	Part No.	Part Name & Description
d1	PJWM1P7100M	Pickup Solenoid Assembly
d2	PJZE1P7100M	Pickup Lever Assembly
d3	PJDSB0038Z	Pickup Spring
d4	PJDGB0040Z	Pickup Internal Gear
d5	PJDGB0029Z	Planetary Gear
d6	PJDGB0041Z	Pickup Arm Gear
d7	PJDGB0027Z	Ratchet Gear
d8	PJZFP7100M	Pickup Roller Shaft
d9	PJZRP7100M	Pickup Roller Assembly
d10	XTW3+U8S	Screw 3 x 8 mm
d11	PJDJB0019Z	Bushing
d12	PJDJ05041RZ	Bushing
d13	PJDGB0038Z	Registration Roller Gear
d14	PJDRB0021Z	Registration Roller
d15	PJHRB0070Z	Drive Wheel
d16	PJDGB0039Z	Paper Feed Roller Gear
d17	PJDRB0022Z	Paper Feed Roller
d18	PJHE5065Z	Screw
d19	PJHRB0072Z	Sub. Paper Guide

10.2.3. Motor and Drive Gear Unit

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▲ GL-YM-103
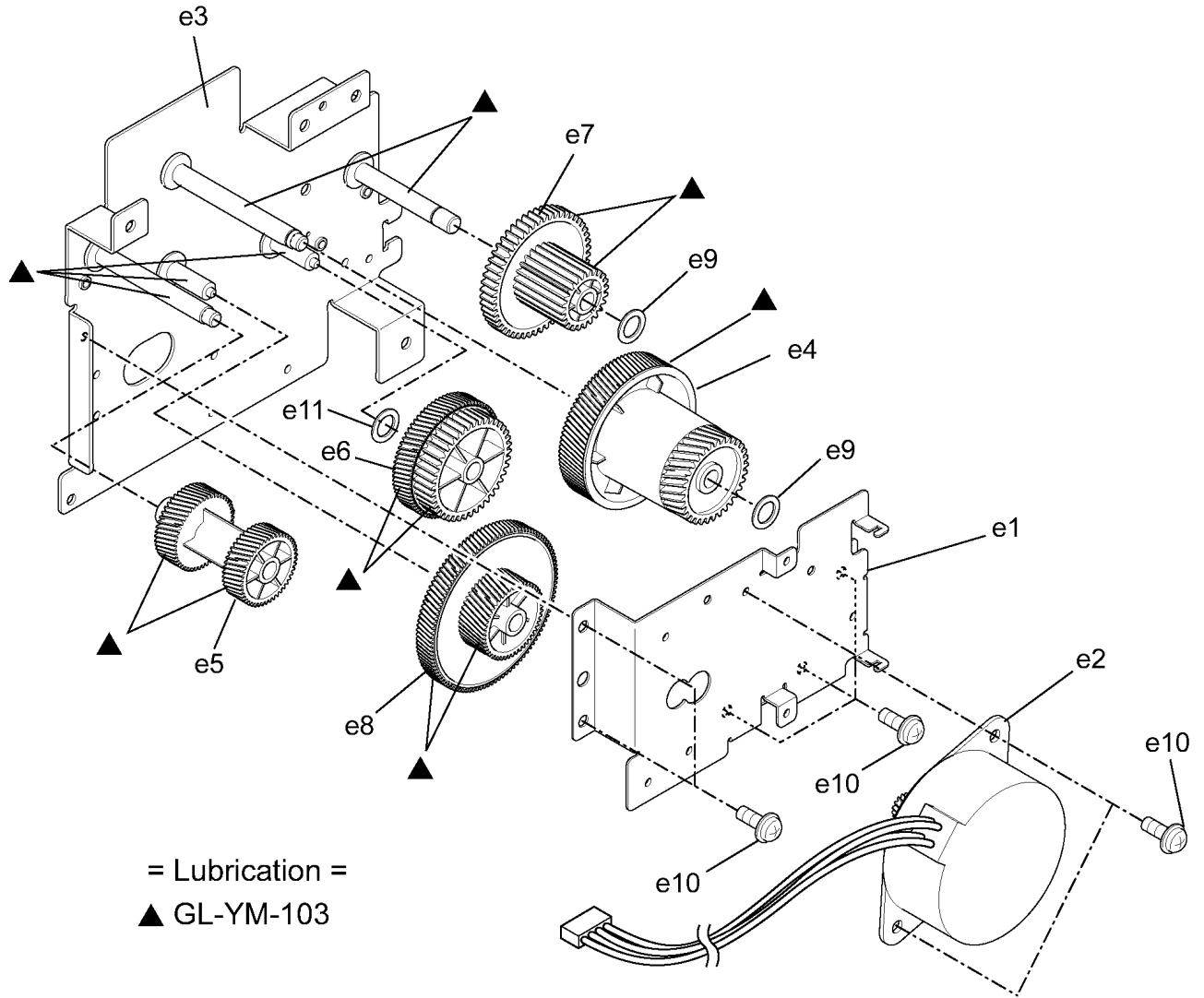
Ref. No.	Part No.	Part Name & Description
e1	PJMDB0032Z	Motor Bracket
e2	PJJQP5566Z	Motor
e3	PJZHP7100M	Drive Gear Bracket Assembly
e4	PJDGB0048Z	OPC Gear (A)
e5	PJDGB0049Z	Fuser Gear
e6	PJDGB0056Z	Registration Gear (A)
e7	PJDGB0069Z	Registration Gear (B)
e8	PJDGB0047Z	OPC Gear (B)
e9	PJNW525Z	Plastic Ring
e10	XTW3+6L	Screw 3 x 6 mm
e11	PJNW620Z	Plastic Ring

## 10.3. Left Side Parts (Power Supply Unit and High Voltage Board)

Ref. No.	Part No.	Part Name & Description	Remarks
f1	PJWSP7100M	Power Lead Wire Assembly	⚠
f2	PJMCB0042Z	Inlet Bracket	
f3	PJLP1S58Z	Power Supply Board Complete	⚠ Non-Repairable
f4	PJMCB0004Z	Enclosure Cover	
f5	PJWP7P7100M	High Voltage Board Complete	⚠ Non-Repairable
f6	XYN3+F8	Screw 3 x 8 mm	
f7	PJDSB0033Z	Grid Spring	
f8	PJDSB0009Z	OPC Spring	
f9	PJDSB0013Z	Transfer Roller Bias Spring	
f10	PJDSB0148Z	Charge Spring	
f11	XYC3+FF8C	Screw 3 x 8 mm	
f12	XTW3+6L	Screw 3 x 6 mm	
f13	XTW3+8L	Screw 3 x 8 mm	
f14	XTS3+6F	Screw 3 x 6 mm	
f15	XSN4+W6	Screw 4 x 6 mm	
f16	PJJQD8060Z	Fan Motor	
f17	XTW3+8S	Screw 3 x 8 mm	
f18	PJNEB0008Z	Screw	
f19	PJDSB0149Z	Deve Spring	
f20	PJWP6P7100M	Relay Board (B) Complete	RTL
f21	XWC4B	Star Washer	

10.4. Rear and Top Side Parts

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■ PJOL-HP500
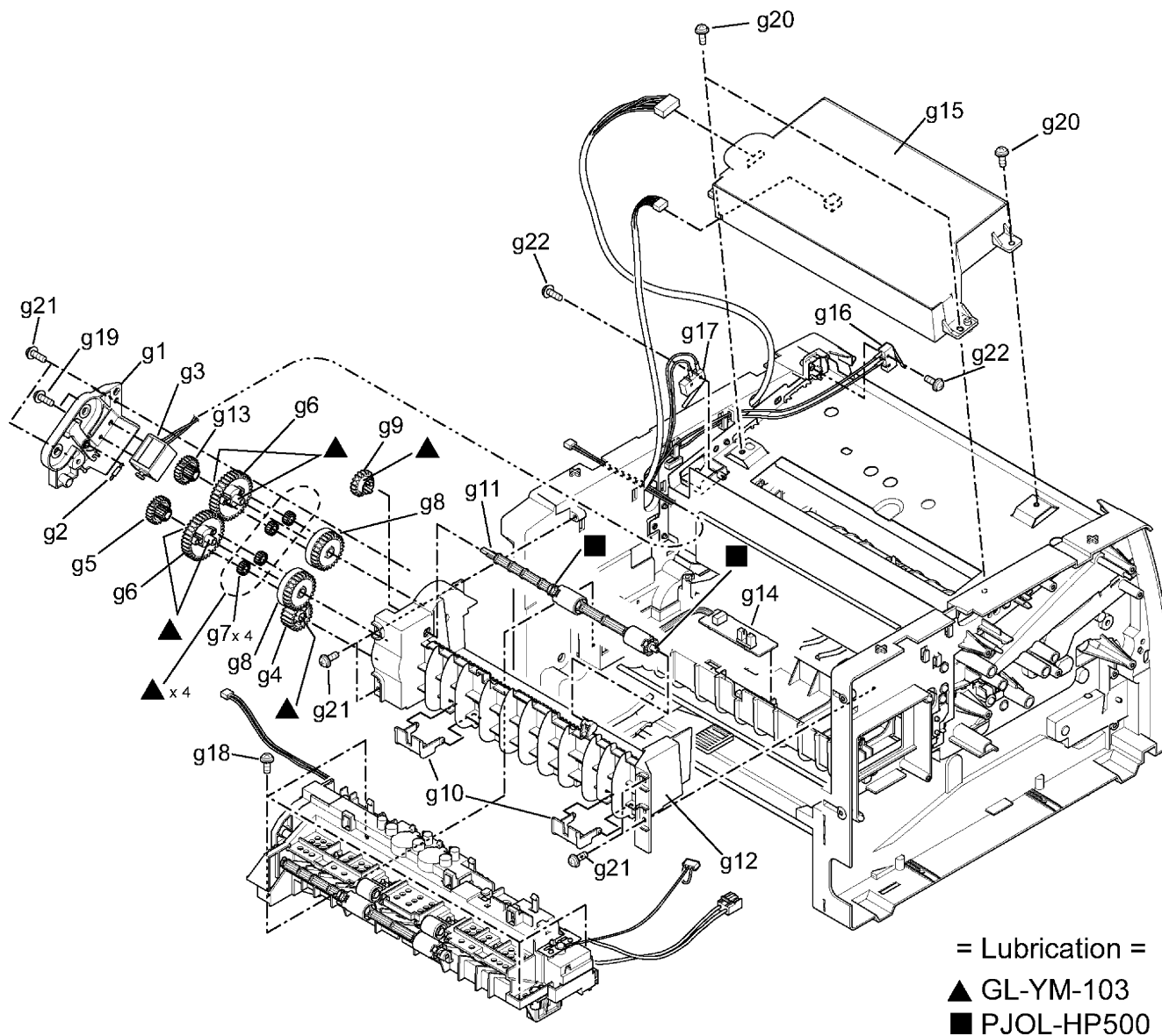
Ref. No.	Part No.	Part Name & Description	Remarks
g1	PJZC1P7100M	Upper Exit Roller Holder Cover Assembly	
g2	PJDSB0016Z	Ratchet Spring	
g3	PJDPB0001Z	Upper Exit Roller Solenoid with Plunger	
g4	PJDGB0024Z	Upper Exit Roller Drive Gear Z21	
g5	PJDGB0027Z	Black Ratchet Gear	
g6	PJDGB0026Z	Upper Exit Roller Drive Gear Z36	
g7	PJDGB0029Z	Planetary Gear	
g8	PJDGB0025Z	Internal Gear	
g9	PJDGB0022Z	Upper Exit Roller Drive Gear	
g10	PJHRB0024Z	Paper Guide	
g11	PJZR2P7100M	Upper Exit Roller Assembly (gray roller)	
g12	PJHRB0019Z	Upper Exit Roller Holder	
g13	PJDGB0028Z	Ratchet Gear	
g14	PJWP2P7100M	Paper Exit/ADU Paper Jam Sensor Board	RTL
g15	PJWEP7100M	LSU (Laser Scanning Unit)	⚠
g16	PJWS1P7100M	Front Door Safety Interlock Switch	
g17	PJWS2P7100M	OPC Drum Unit Interlock Switch	
g18	XTW3+12S	Screw 3 x 12 mm	
g19	XSN3+4	Screw 3 x 4 mm	
g20	XYC3+FF8C	Screw 3 x 8 mm	
g21	XTW3+8S	Screw 3 x 8 mm	
g22	XTB2+12J	Screw 2 x 12 mm	

10.4.1. Fuser Unit

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■ PJOL-HP500
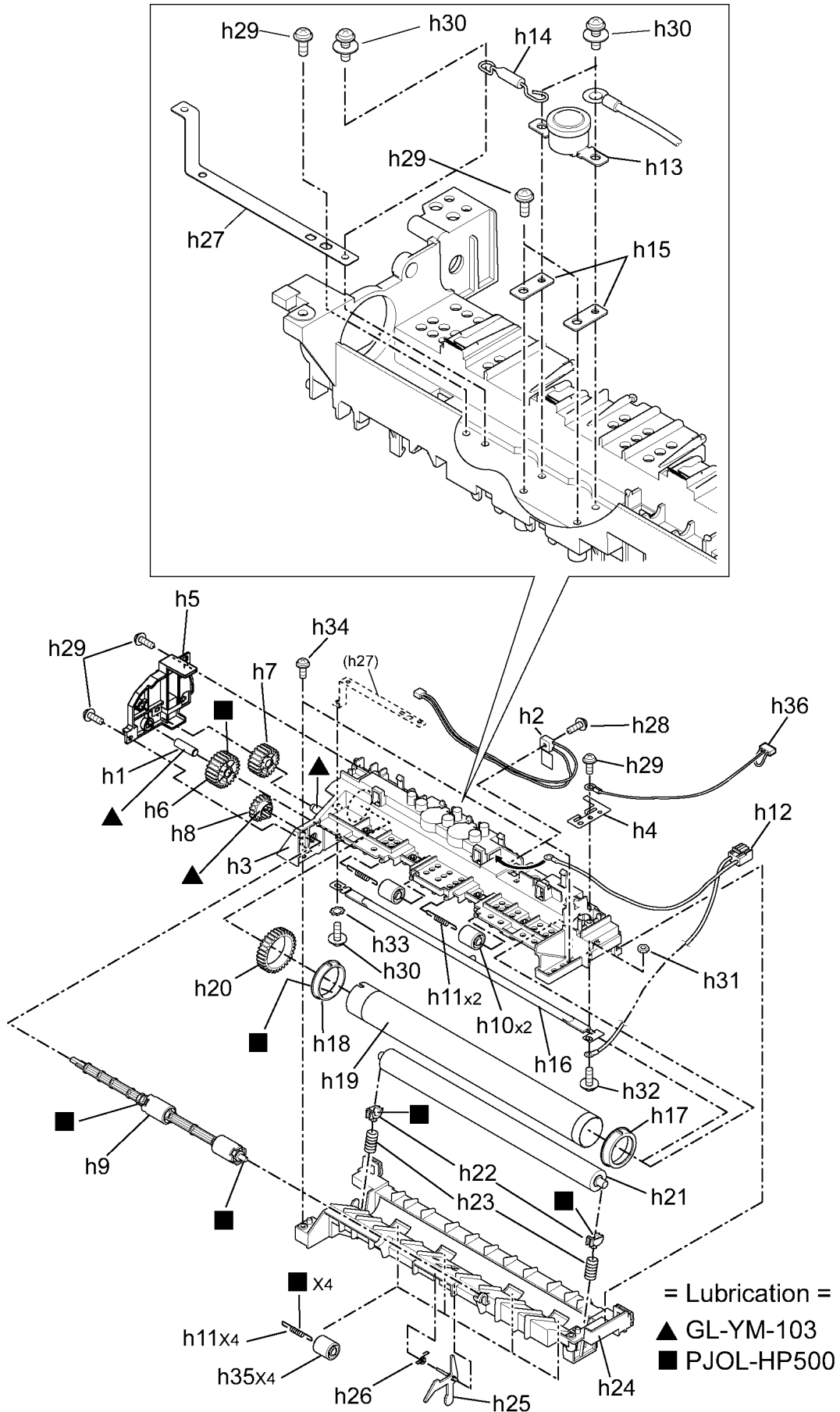
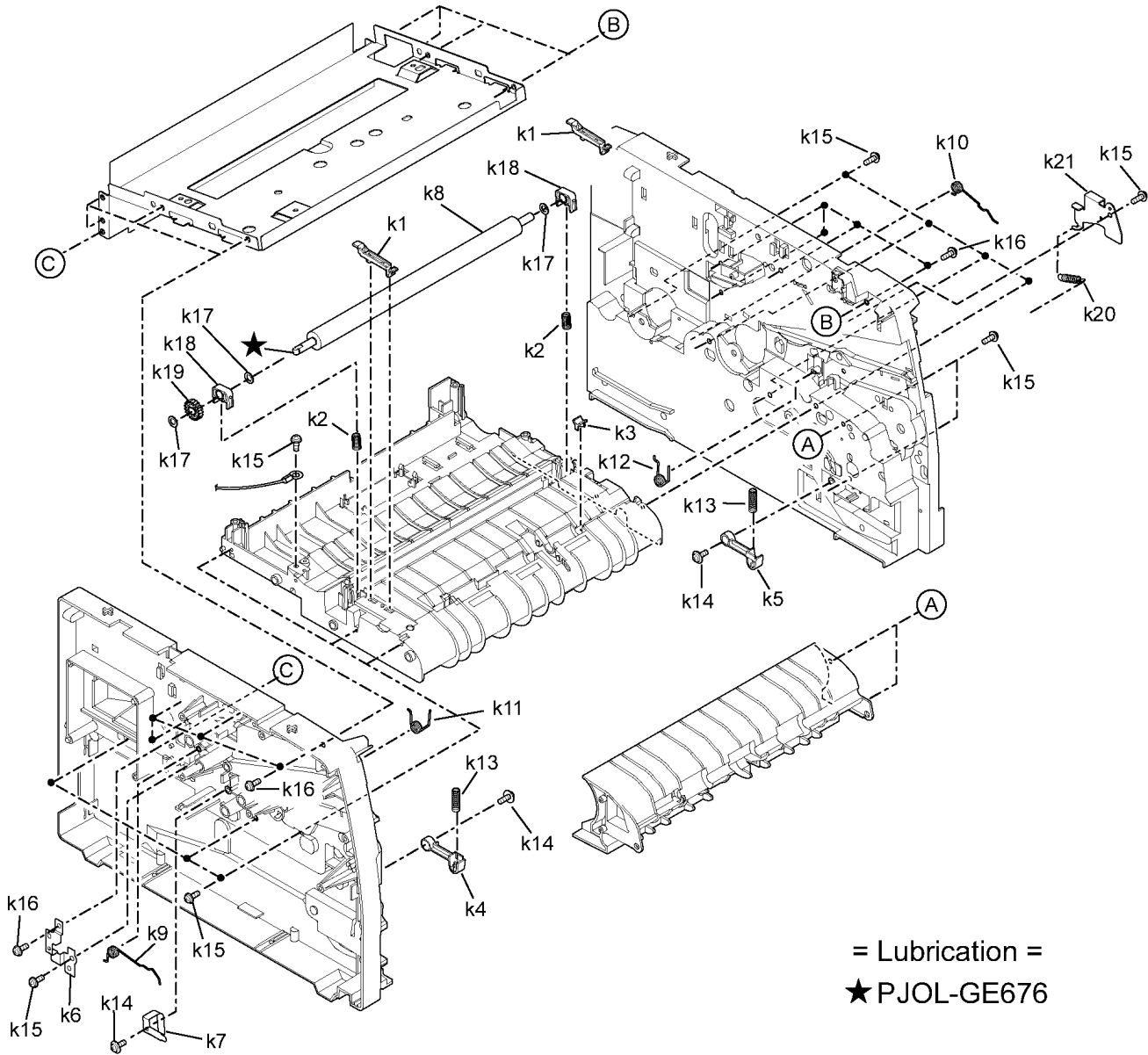| Ref. No.	Part No.	Part Name & Description
h1	PJDFB0122Z	Fuser Drive Shaft
h2	PJRTS10Z	Thermistor
h3	PJZCP7100M	Heat Roller Holder Assembly
h4	PJMDB0019Z	Fuser Earth
h5	PJZC3P7100M	Side Fuser Cover Assembly
h6	PJDGB0023Z	Fuser Gear Z24
h7	PJDGB0024Z	Fuser Gear Z21
h8	PJDGB0022Z	Lower Exit Roller Gear
h9	PJZR3P7100M	Lower Exit Roller Assembly (black roller)
h10	PJDRB0017Z	Pinch Roller
h11	PJDSB0018Z	Pinch Roller Spring (A)
h12	PJJRML0009Z	Fuser Cable
h13	PJSE180003Z	Thermostat
h14	PJXE10M16901	Thermal Fuse
h15	PJMDB0018Z	Lead Wire Plate
h16	PJAH06009Z	Heat Lamp (Halogen Lamp)
h17	PJDJB0008Z	Heat Roller Bushing (L)
h18	PJDJB0009Z	Heat Roller Bushing (R)
h19	PJDRB0011Z	Heat Roller
h20	PJDGB0021Z	Heat Roller Gear
h21	PJDRB0012Z	Pressure Roller
h22	PJDJB0010Z	Pressure Roller Bushing
h23	PJDSB0014Z	Pressure Roller Spring
h24	PJHRB0018Z	Fuser Unit Base
h25	PJHRB0022Z	Paper Exit/ADU Paper Jam Sensor Lever
h26	PJDSB0015Z	Paper Exit/ADU Paper Jam Sensor Lever Spring
h27	PJMDB0017Z	Lead Wire Plate
h28	XTW3+12S	Screw 3 x 12 mm
h29	XTW3+8S	Screw 3 x 8 mm
h30	XYC3+FF8C	Screw 3 x 8 mm
h31	XNG3B	Nut
h32	XYN3+F8	Screw 3 x 8 mm
h33	XWC3B	Star Washer
h34	XTW3+12SFZ	Screw 3 x 12 mm (black)
h35	PJZR1P7100M	Cleaning Roller Assembly
h36	PJJTCF006Z	Cable

10.5. Bottom Side Parts

= Lubrication =
★ PJOL-948P
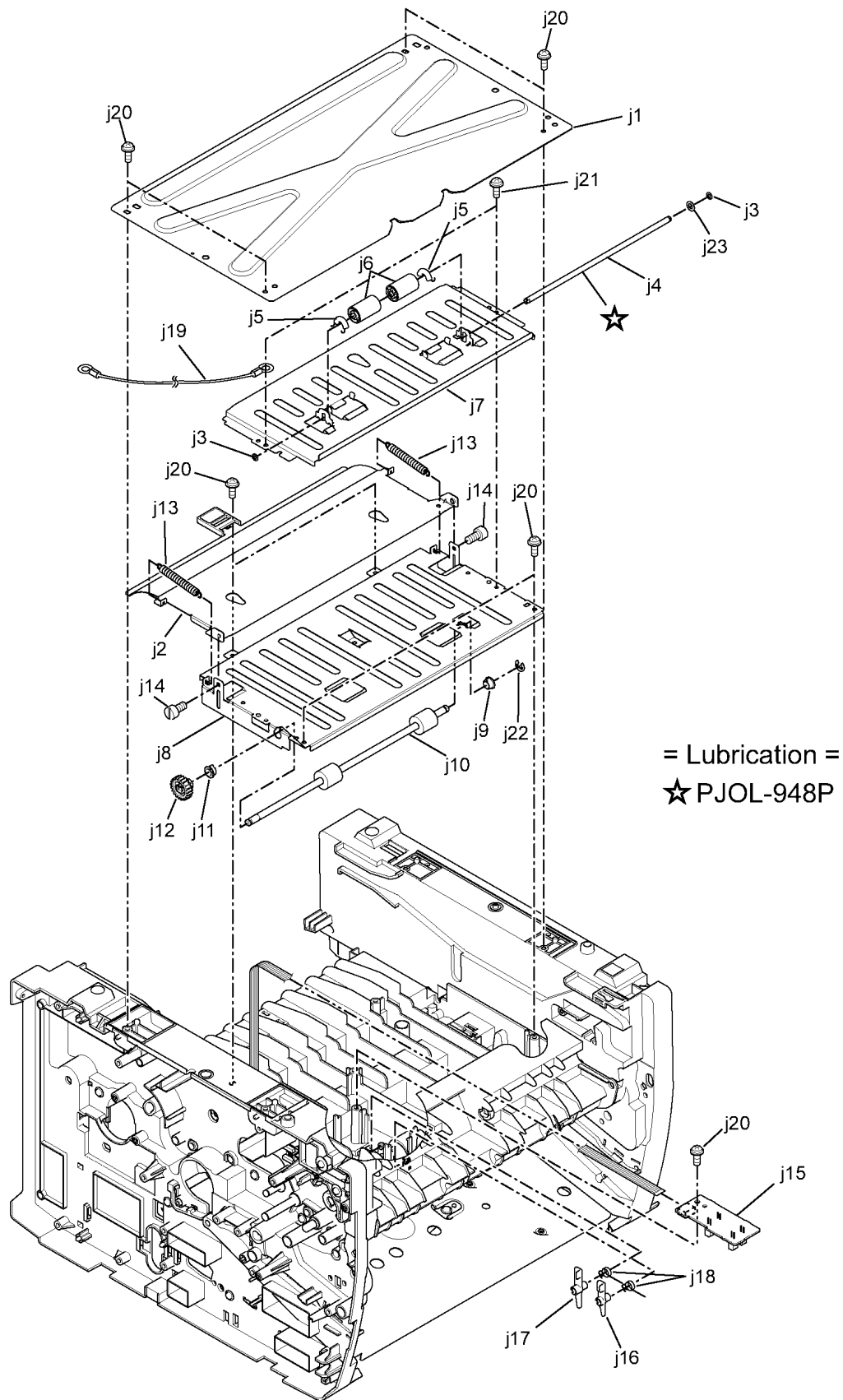
Ref. No.	Part No.	Part Name & Description	Remarks
j1	PJUAB0024Z	Bottom Stay	
j2	PJZUP7100M	Jam Release Pan with Knob	
j3	PJNW317Z	Plastic Ring	
j4	PJDFB0009Z	A/D Roller Shaft	
j5	PJDSB0041Z	Pinch Roller Spring	

Ref. No.	Part No.	Part Name & Description	Remarks
j6	PJDRB0018Z	Auto Duplex Pinch Roller	
j7	PJMDB0020Z	ADU Pinch Roller Plate	
j8	PJUAB0005Z	ADU Registration Roller Plate	
j9	PJDJ05041RZ	Bushing	
j10	PJDRB0014Z	ADU Registration Roller Shaft	
j11	PJDJ05011CZ	Bushing	
j12	PJDGB0030Z	A/D Unit Joint Gear	
j13	PJDSB0017Z	Spring	
j14	PJNEB0003Z	Screw	
j15	PJWP1P7100M	Registration & Paper Top Sensor Board Complete	RTL
j16	PJHRB0075Z	Registration Sensor Lever	
j17	PJHRB0076Z	Paper Top Sensor Lever	
j18	PJDSB0035Z	Registration Spring	
j19	PJJTCC014Z	Cable	
j20	XTW3+8S	Screw 3 x 8 mm	
j21	XTW3+6L	Screw 3 x 6 mm	
j22	XUC4VW-V	E-ring	
j23	PJNW410Z	Plastic Ring	

10.6. Mechanical Base

= Lubrication =
★ PJOL-GE676

Ref. No.	Part No.	Part Name & Description
k1	PJHRB0324Z	Transfer Roller Holder
k2	PJDSB0040Z	Transfer Spring
k3	PJDJB0020Z	U Bearing
k4	PJHRB0038Z	Pressure Arm (L)
k5	PJHRB0037Z	Pressure Arm (R)
k6	PJUSB0011Z	Earth Plate
k7	PJUSB0008Z	Transfer Roll Bias Plate
k8	PJDRB0024Z	Transfer Roller
k9	PJDSB0026Z	OPC Spring (L)
k10	PJDSB0008Z	OPC Spring (R)
k11	PJDSB0043Z	Resist Spring (L)
k12	PJDSB0010Z	Resist Spring (R)
k13	PJDSB0024Z	Cassette Guide Spring
k14	XTW3+U8S	Screw 3 x 8 mm
k15	XTW3+8S	Screw 3 x 8 mm
k16	XTW3+6L	Screw 3 x 6 mm
k17	PJNW525Z	Plastic Ring
k18	PJHRB0078Z	Bushing
k19	PJDGB0057Z	Transfer Gear
k20	PJDSB0038Z	Registration Lever Spring
k21	PJMDB0175Z	Relay Plate

10.7. Media Tray (Paper Cassette)
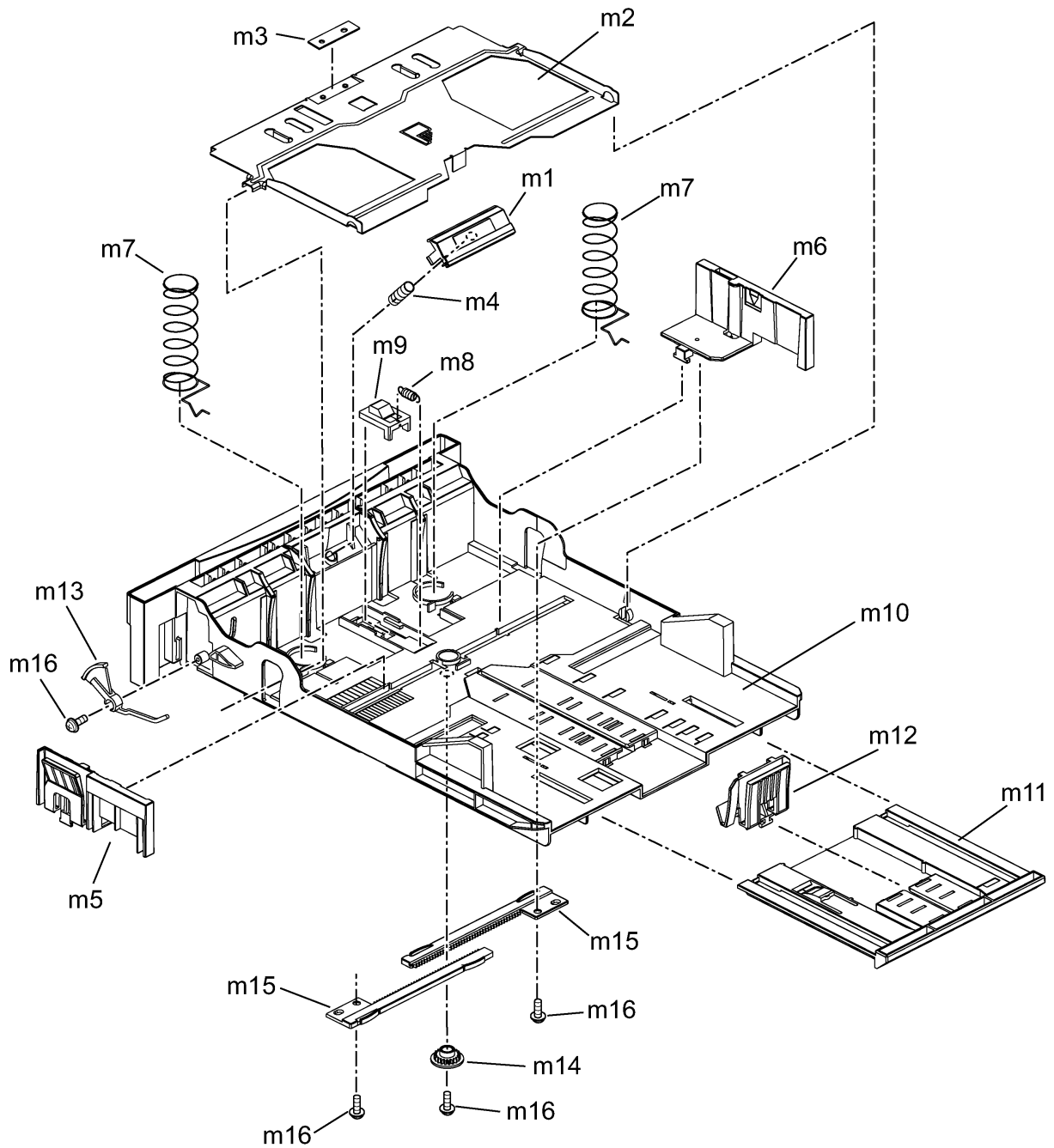
Ref. No.	Part No.	Part Name & Description
m1	PJZEP7100M	Retard Pad Assembly
m2	PJMDB0026Z	Media Lifter
m3	PJHSB0007Z	Friction Pad
m4	PJDSB0021Z	Retard Pad Spring
m5	PJHRB0031Z	Media Side Guide (R)
m6	PJHRB0032Z	Media Side Guide (L)
m7	PJDSB0022Z	Friction Spring
m8	PJDSB0020Z	Stopper Spring
m9	PJHRB0034Z	Stopper
m10	PJYMP7100M	Cassette Base Assembly
m11	PJHRB0030Z	Cassette Extension Tray
m12	PJHRB0033Z	Media Size Knob
m13	PJHRB0307Z	Indicator
m14	PJDG50133Z	Pinion Gear
m15	PJHRB0036Z	Rack
m16	XTW3+U8S	Screw 3 x 8 mm

10.8. Packing
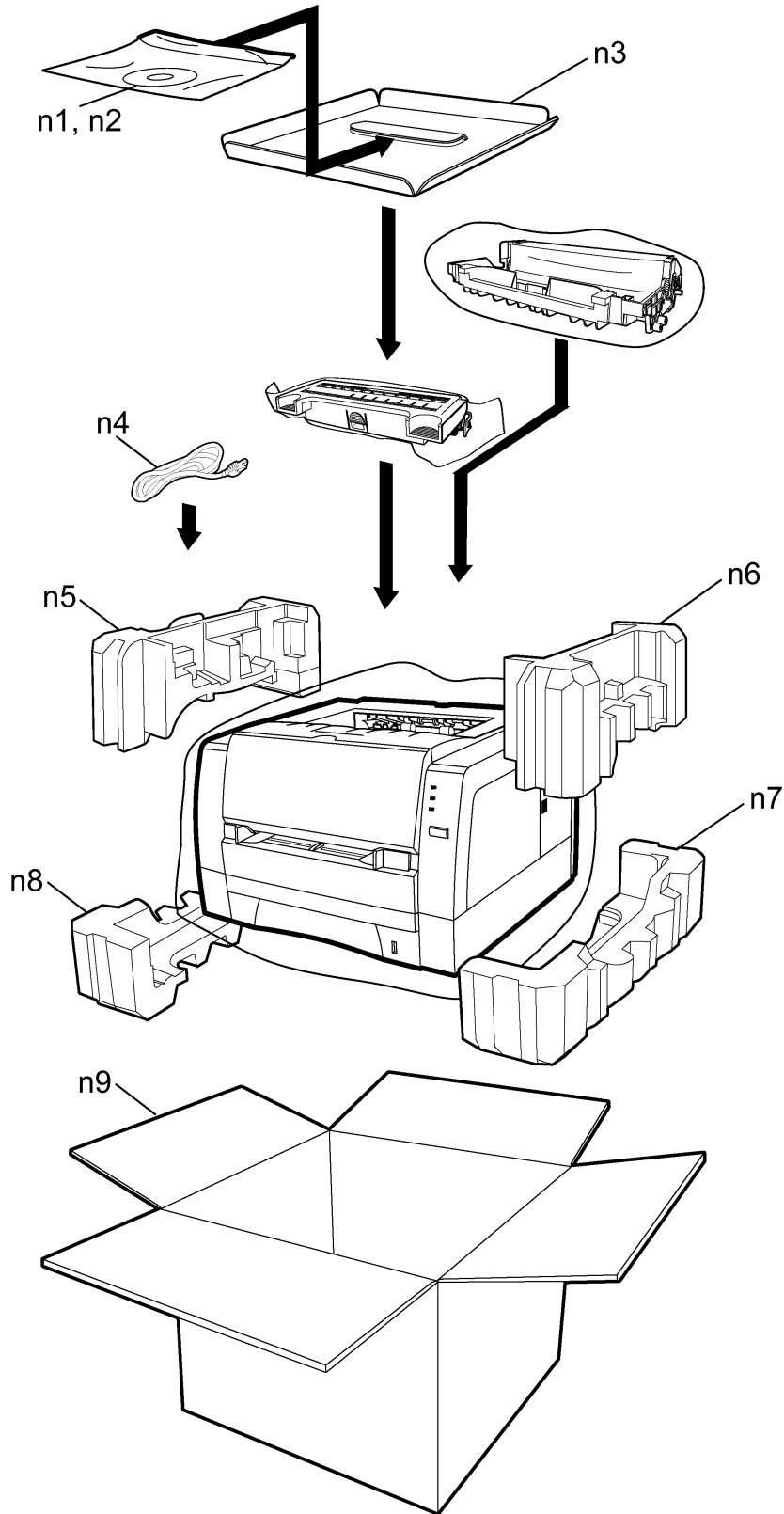
Ref. No.	Part No.	Part Name & Description	Remarks
n1	PJWRP7100M	CD-ROM	
n2	PJQQB0002Z	Setup Guide (English)	
n3	PJPNB0026Z	Pad for CD-ROM	
n4	PFJA1030Z	Power Cord	⚠
n5	PJPNB0024Z	Top Pad (L)	
n6	PJPNB0025Z	Top Pad (R)	
n7	PJPNB0031Z	Bottom Pad (R)	
n8	PJPNB0030Z	Bottom Pad (L)	
n9	PJPGB0012Z	Carton Box	

10.9. Main Control Board

Component Side View
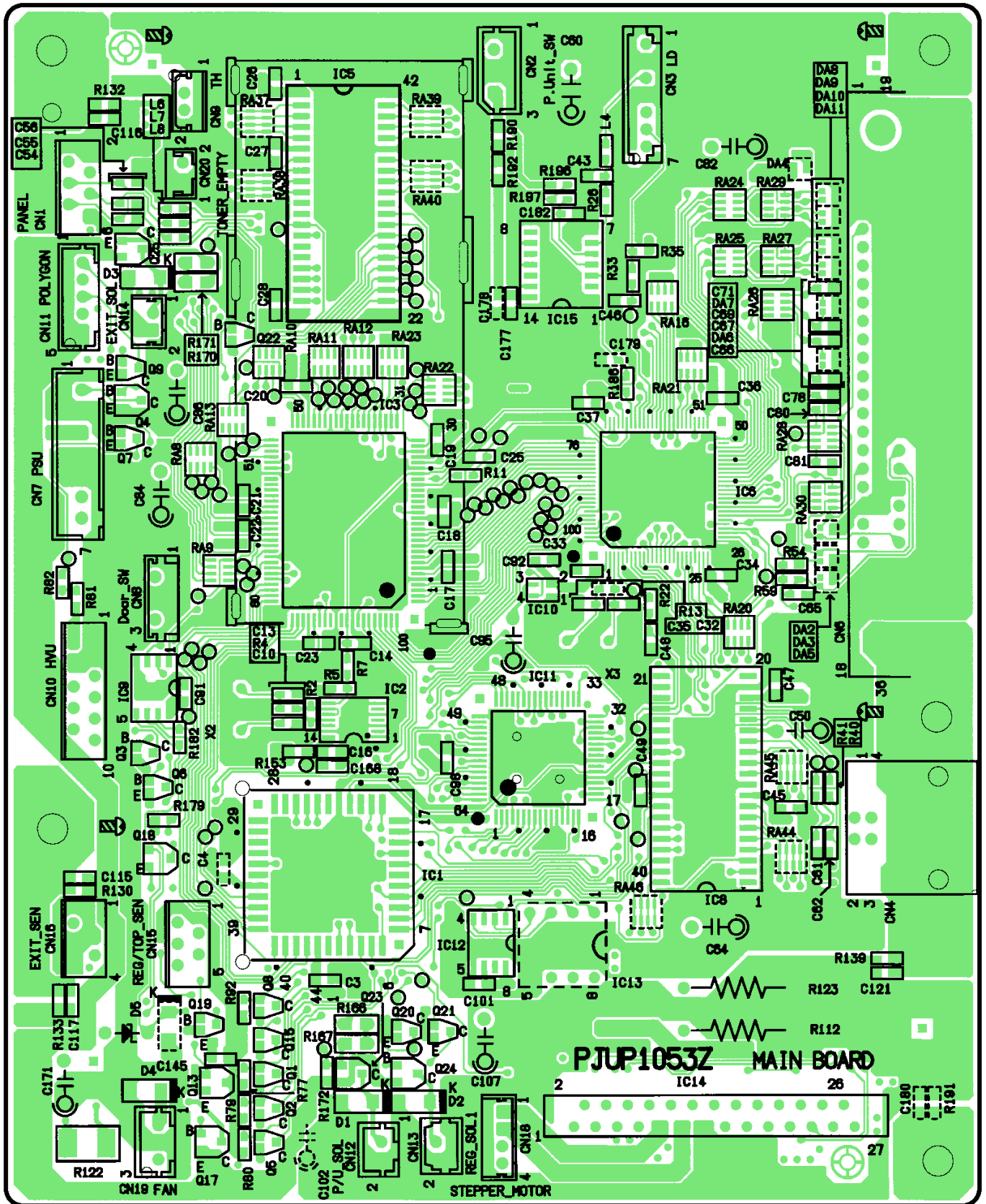
Parts Side View
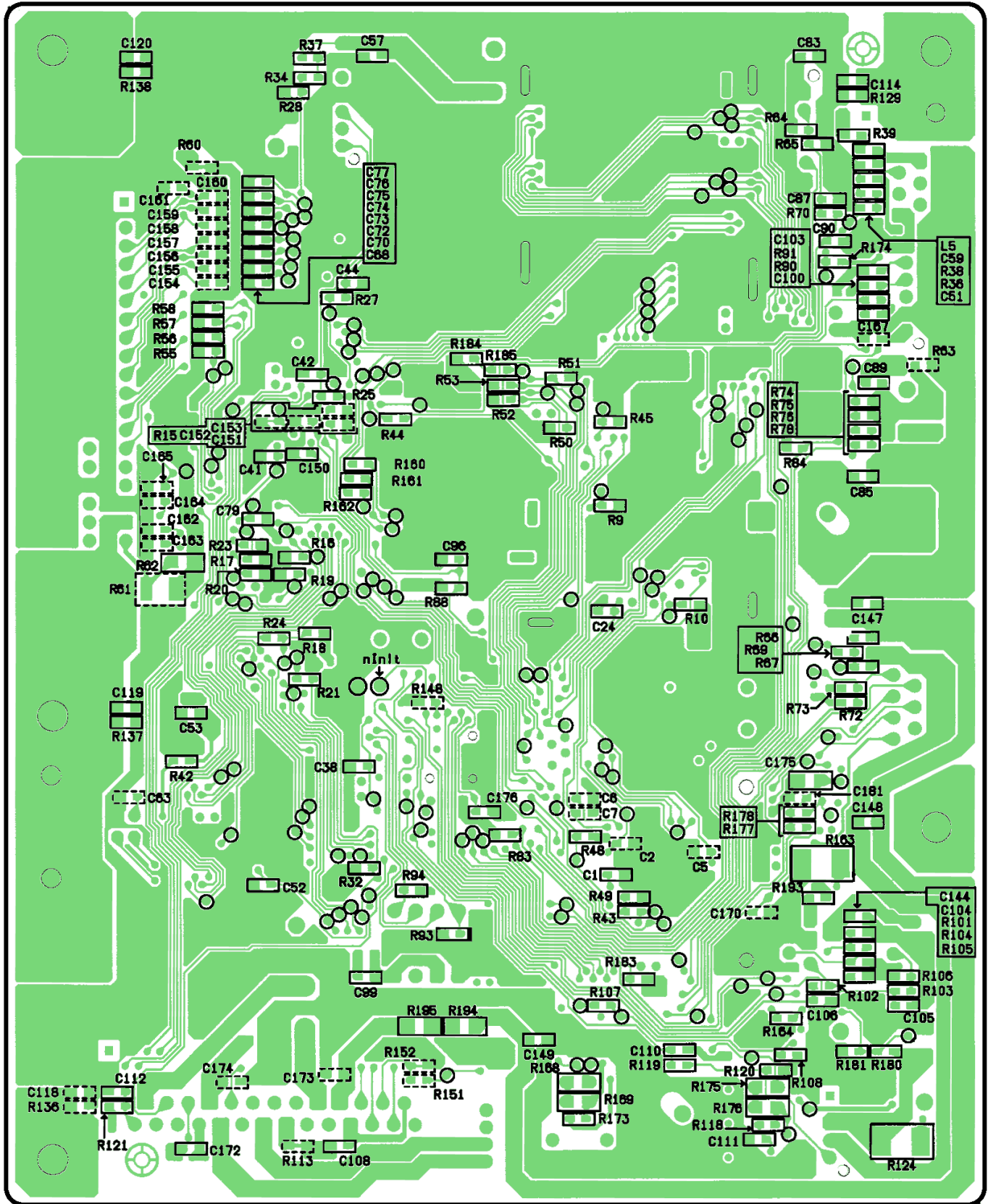
10.9.1. ICs

Ref. No.	Part No.	Part Name & Description
IC1	PJWIP7100M	IC (Main Control CPU/ROM)
IC2	TC74HCUV04FT	IC (Standard Logic)
IC3	D6004	IC (GDI-ASIC)
IC5	IS41C16100K5	IC (DRAM)
IC6	PJVANG0022Z	IC (KME-ASIC)
IC8	GL107AS	IC (USB Bridge)
IC9	PJVINJM2903M	IC (Comparator)
IC10	PST3642UR	IC (Reset)
IC11	PJWI1P7100M	IC (Engine CPU/ROM)
IC12	C3EBDG000024	IC (EEPROM)
IC14	MTD2003B4101	IC (Motor Driver)

10.9.2. Capacitors

All capacitor values are in microfarads unless otherwise noted.

Ref. No.	Part No.	Part Name & Description
C1	ECUV1H101JCV	Ceramic / 100p / 50V
C3	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C10/C13	ECUV1H050CCV	Ceramic / 5p / 50V
C14	ECUX1H100DCV	Ceramic / 10p / 50V
C16-C23	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C24	ECUV1H101JCV	Ceramic / 100p / 50V
C25	ECUX1H100DCV	Ceramic / 10p / 50V
C26-C28	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C32	ECUX1H100DCV	Ceramic / 10p / 50V
C33-C34	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C35	ECUX1H100DCV	Ceramic / 10p / 50V
C36/C37	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C38	ECUV1H101JCV	Ceramic / 100p / 50V
C41	ECUV1H102KBV	Ceramic / 1000p / 50V
C42	ECUV1H271JCV	Ceramic / 270p / 50V
C43	ECUV1H181JCV	Ceramic / 180p / 50V
C44	ECUV1H271JCV	Ceramic / 270p / 50V
C45	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C46	ECUV1H101JCV	Ceramic / 100p / 50V
C47	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C48	ECUX1H100DCV	Ceramic / 10p / 50V
C49	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C50	ECEA1EKA4R7	Electrolytic / 4.7 / 25V
C51	ECUV1H102KBV	Ceramic / 1000p / 50V
C52	ECUV1H101JCV	Ceramic / 100p / 50V
C53	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C54-C56	ECUV1H102KBV	Ceramic / 1000p / 50V
C57/C59	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C60	ECEA0JKA470	Electrolytic / 47 / 6.3V
C61/C62	ECUX1H470JCV	Ceramic / 47 / 50V
C64	ECEA0JKA470	Electrolytic / 47 / 6.3V
C65-C77	ECUV1H101JCV	Ceramic / 100p / 50V
C78	ECUV1H471JCV	Ceramic / 470p / 50V
C79-C81	ECUV1H101JCV	Ceramic / 100p / 50V
C82	ECEA0JKA470	Electrolytic / 47 / 6.3V
C83	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C84	ECEA1HGE470	Electrolytic / 47 / 35V
C85	ECJ1VF1H104Z	Ceramic / 0.1 / 50V
C86	ECEA0JKA470	Electrolytic / 47 / 6.3V
C87	ECUV1H102KBV	Ceramic / 1000p / 50V
C89	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C90	ECUV1H102KBV	Ceramic / 1000p / 50V
C91	ECJ1VF1H104Z	Ceramic / 0.1 / 50V
C92	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C95	ECEA1HKR47	Electrolytic /0.47 /50V
C96/C98/C99	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C100	ECUV1H102KBV	Ceramic / 1000p / 50V
C101	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C103-C106	ECUV1H102KBV	Ceramic / 1000p / 50V
C107	ECEA1HGE470	Electrolytic / 47 / 50V
C108	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C110	ECUV1H102KBV	Ceramic / 1000p / 50V
C111	ECJ1VF1H104Z	Ceramic / 0.1 / 50V

Ref. No.	Part No.	Part Name & Description
C112	ECUX1H332KBV	Ceramic / 3300p / 50V
C114-C117	ECUV1H102KBV	Ceramic / 1000p / 50V
C119-C121	ECUV1H102KBV	Ceramic / 1000p / 50V
C144/C145	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C147-C149	ECJ1VF1H104Z	Ceramic / 0.1 / 50V
C150	ECUV1H101JCV	Ceramic / 100p / 50V
C166	ECJ1VF1H104Z	Ceramic / 0.1 / 50V
C168	ECUV1H102KBV	Ceramic / 1000p / 50V
C171	ECEA1HGE470	Electrolytic / 47 / 35V
C172	ECUV1C104ZFV	Ceramic / 0.1 / 16V
C175	ECJ2VF1C105Z	Ceramic / 1 / 16V
C176	ECUV1H102KBV	Ceramic / 1000p / 50V
C182	ECUV1H101JCV	Ceramic / 100p / 50V

10.9.3. Resistors

All resistor values are in OHMs.

Ref. No.	Part No.	Part Name & Description
R2	ERJ3GSYJ472V	Chip Resistor / 4.7k (1/16W)
R4	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
R5	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R7	ERJ3GSYJ270V	Chip Resistor / 27 (1/16W)
R9/R10	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R11	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
R16-R20	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R21/R22	ERJ3GSYJ100V	Chip Resistor / 10 (1/16W)
R23	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R24	ERJ3GSYJ330V	Chip Resistor / 33 (1/16W)
R25	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
R26	ERJ3GSYJ100V	Chip Resistor / 10 (1/16W)
R27	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
R28	ERJ3GSYJ513V	Chip Resistor / 51k (1/16W)
R32	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R33	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
R34	ERJ3GSYJ511V	Chip Resistor / 510 (1/16W)
R35	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R36/R37	ERJ3GSYJ511V	Chip Resistor / 510 (1/16W)
R38	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R39	ERJ3GSYJ1R0V	Chip Resistor / 1.0 (1/16W)
R40/R41	ERJ3GSYJ270V	Chip Resistor / 27 (1/16W)
R42	ERJ3GSYJ152V	Chip Resistor / 1.5k (1/16W)
R43/R44	ERJ3GSYJ330V	Chip Resistor / 33 (1/16W)
R45/R48	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R50-R58	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R59	ERJ3GSYJ330V	Chip Resistor / 33 (1/16W)
R62	ERJ6GEYJ1R0V	Chip Resistor / 1.0 (1/10W)
R64	ERJ3EKF3903V	Chip Resistor / 390k (1/16W)
R65	ERJ3EKF1802V	Chip Resistor / 18k (1/16W)
R66	ERJ3GSYJ513V	Chip Resistor / 51k (1/16W)
R67	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R69/R70	ERJ3GSYJ102V	Chip Resistor / 1k (1/16W)
R72-R75	ERJ3GSYJ222V	Chip Resistor / 2.2k (1/16W)
R76	ERJ3GSYJ102V	Chip Resistor / 1k (1/16W)
R77	ERJ3GSYJ472V	Chip Resistor / 4.7k (1/16W)
R78	ERJ3GSYJ102V	Chip Resistor / 1k (1/16W)
R79/R80	ERJ3GSYJ472V	Chip Resistor / 4.7k (1/16W)
R81-R84	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R88	ERJ3GSYJ472V	Chip Resistor / 4.7k (1/16W)
R90	ERJ3GSYJ511V	Chip Resistor / 510 (1/16W)
R91	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R92	ERJ3GSYJ472V	Chip Resistor / 4.7k (1/16W)
R93/R94	ERJ3GSYJ513V	Chip Resistor / 51k (1/16W)
R101-R103	ERJ3GSYJ511V	Chip Resistor / 510 (1/16W)
R104-R106	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R107	ERJ3GSYJ222V	Chip Resistor / 2.2k (1/16W)
R108	ERJ3GSYJ472V	Chip Resistor / 4.7k (1/16W)
R112	ERX1SGR47P	Metal / 0.47 (1W)
R118	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R119	ERJ3GSYJ511V	Chip Resistor / 510 (1/16W)
R120	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)

Ref. No.	Part No.	Part Name & Description
R121	ERJ3GSYJ183V	Chip Resistor / 18k (1/16W)
R122	ERJ12YJ120H	Chip Resistor / 12 (1/2W)
R123	ERX1SGR47P	Metal / 0.47 (1W)
R124	ERJ12YJ120H	Chip Resistor / 12 (1/2W)
R129/R130	ERJ3GSYJ100V	Chip Resistor / 10 (1/16W)
R132/R133	ERJ3GSYJ100V	Chip Resistor / 10 (1/16W)
R136-R139	ERJ3GSYJ100V	Chip Resistor / 10 (1/16W)
R153	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
R160-R162	ERJ3GSYJ470V	Chip Resistor / 47 (1/16W)
R163	ERJ12YJ180H	Chip Resistor / 18 (1/2W)
R164	ERJ3GSYJ221V	Chip Resistor / 220 (1/16W)
R166-R171	ERJ6GEYJ222	Chip Resistor / 2.2k (1/10W)
R172-R174	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R175/R176	ERJ6GEYJ222	Chip Resistor / 2.2k (1/10W)
R177	ERJ3GSYJ224V	Chip Resistor / 220k (1/16W)
R178	ERJ3GSYJ183V	Chip Resistor / 18k (1/16W)
R179	ERJ3GSYJ222V	Chip Resistor / 2.2k (1/16W)
R180	ERJ3EKF2403V	Chip Resistor / 240k (1/16W)
R181	ERJ3GSYJ393V	Chip Resistor / 39k (1/16W)
R182	ERJ3GSYJ105V	Chip Resistor / 1M (1/16W)
R183	ERJ3GSYJ103V	Chip Resistor / 10k (1/16W)
R184	ERJ3GSYJ474V	Chip Resistor / 470k (1/16W)
R185	ERJ3GSYJ511V	Chip Resistor / 510 (1/16W)
R186	ERJ3GSYJ221V	Chip Resistor / 220 (1/16W)
R190	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
R192	ERJ3GSYJ470V	Chip Resistor / 47 (1/16W)
R193	ERJ3GSYJ1R0V	Chip Resistor / 1.0 (1/16W)
R194/R195	ERJ6GEYJ0R0V	Chip Resistor / 0 (1/10W)
R196	ERJ3GSYJ222V	Chip Resistor / 2.2k (1/16W)
R197	ERJ3GSYJ101V	Chip Resistor / 100 (1/16W)
RA8-RA13	EXBV8V470JV	Resistor Array
RA16	EXBV8V222JV	Resistor Array
RA20	EXBV8V330JV	Resistor Array
RA21	EXBV8V103JV	Resistor Array
RA22	EXBV8V330JV	Resistor Array
RA23	EXBV8V103JV	Resistor Array
RA24/RA25	EXBV8V102JV	Resistor Array
RA27-RA30	EXBV8V102JV	Resistor Array

10.9.4. Transistor and Diodes

Ref. No.	Part No.	Part Name & Description
D1-D4	PJVDJS132C01	Diode
Q1-Q3	PJVTIRANBAD3	Transistor
Q4	2SC2412KR	Transistor
Q5-Q9	PJVTIRANBAD3	Transistor
Q13	2SA1036KR	Transistor
Q15	PJVTIRANBAD3	Transistor
Q17	2SA1036KR	Transistor
Q18	2SC2411KR	Transistor
Q19	PJVIDTA114EU	Transistor
Q20-Q22	PJVTIRANBAD3	Transistor
Q23-Q25	2SA1036KR	Transistor

10.9.5. Connectors

Ref. No.	Part No.	Part Name & Description
CN1	06FE-BT-VK-N	Connector (for Indicator Board)
CN2	PJJP03AK01Z	Connector (for 5V Interlock Switch)
CN3	PJJP252Z	Connector (for LSU)
CN4	PJJS04EZ03Z	Connector (for USB Interface)
CN6	PJJS714Z	Connector (for Centronics Interface)
CN7	B7B-XH-A	Connector (for Power Supply)
CN8	B3B-EH	Connector (Door Switch)
CN9	PJJP475Z	Connector (for Thermistor)
CN10	10FE-BT-VK-N	Connector (for High Voltage Board)
CN11	PBB5B-PH	Connector (for Polygon Motor)
CN12	PJJP168Z	Connector (for Pickup Solenoid)
CN13	53014-0210	Connector (for Registration Solenoid)
CN14	PJJP469Z	Connector (for Exit Solenoid)
CN15	05FE-BT-VK-N	Connector (for Reg/Top Sensor)
CN16	04FE-BT-VK-N	Connector (for Exit Sensor)
CN18	PJJP468Z	Connector (for Main Motor)
CN19	PJJP268Z	Connector (for DC Fan Motor)
CN20	6-173981-2	Connector (for Toner Empty Sensor)

10.9.6. Others

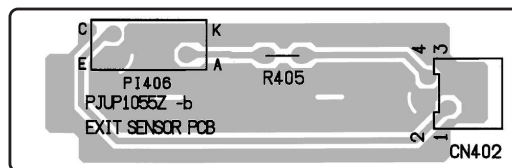| Ref. No.	Part No.	Part Name & Description
X2	HC49U53.8MHZ	X´tal
X3	HC49U12.0MHZ	X´tal

10.10. Registration & Paper Top Detection Sensor Board
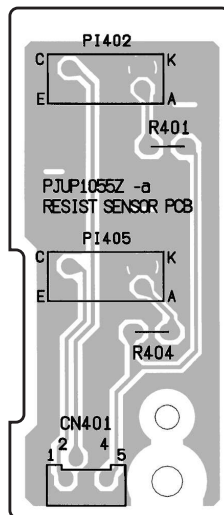
All resistor values are in OHMs.

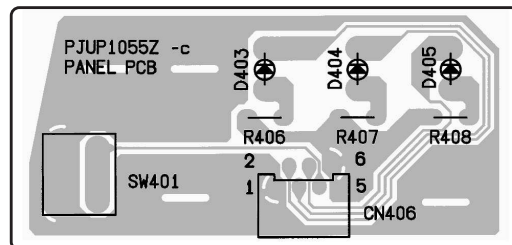| Ref. No.	Part No.	Part Name & Description
R401/R404	ERDS2TJ181T	Resistor / 180 (1/4W)
PI402/PI405	LTH301-07P1M	Photo-interrupter
CN401	05FE-ST-VK-N	Connector
1	PJUP1055Z-A	Bare PCB

10.11. Paper Exit / ADU Paper Jam Sensor Board

Resistor values is in OHMs.

Ref. No.	Part No.	Part Name & Description
R405	ERDS2TJ181T	Resistor / 180 (1/4W)
PI406	LTH301-07P1M	Photo-interrupter
CN402	04FE-ST-VK-N	Connector
1	PJUP1055Z-B	Bare PCB

10.12. Indicator Board

All resistor values are in OHMs.

Ref. No.	Part No.	Part Name & Description
R406-R408	ERDS2TJ181T	Resistor / 180 (1/4W)
D403	LTL4251N-081	LED (Yellow)
D404	LTL4221N-081	LED (Red)
D405	LTL4231N-081	LED (Green)
SW401	SPN-02-5.0	Switch
CN406	06FE-ST-VK-N	Connector

Ref. No.	Part No.	Part Name & Description
1	PJUP1055Z-C	Bare PCB

10.13. Toner Empty Sensor Board
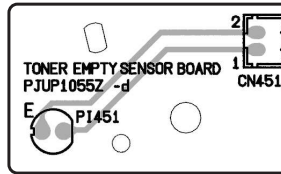
Ref. No.	Part No.	Part Name & Description
PI451	B3HA00000029	Photo Transistor
CN451	6-173981-2	Connector
1	PJUP1055Z-D	Bare PCB

10.14. Relay Board (A)
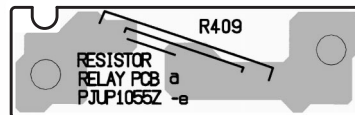
Resistor value is in OHMs.

Ref. No.	Part No.	Part Name & Description
R409	D1AB5006A002	Resistor / 500M (1/2W)
1	PJUP1055Z-E	Bare PCB

10.15. Relay Board (B)
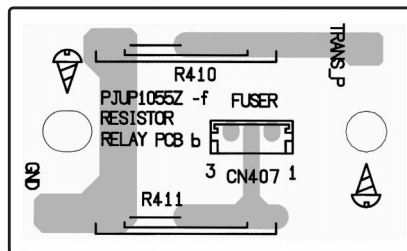
Resistor values are in OHMs.

Ref. No.	Part No.	Part Name & Description
R410	D1AB2006A002	Resistor / 200M (1/2W)
R411	D1AB1006A002	Resistor / 100M (1/2W)
CN407	B3B-EH	Connector
1	PJUP1055Z-F	Bare PCB